DOCUMENT RESUME

ED 467 803 CG 031 906

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TITLE Background for Community-Level Work on Positive Reproductive Health in Adolescence: Reviewing the Literature on Contributing Factors.

INSTITUTION Child Trends, Inc., Washington, DC.

SPONS AGENCY John S. and James L. Knight Foundation, Miami, FL.

PUB DATE 2001-12-00

NOTE 73p.

AVAILABLE FROM Child Trends, 4301 Connecticut Avenue, NW, Suite 100, Washington, DC 20008. Tel: 202-362-5580; Fax: 202-362-5533. For full text: http://www.childtrends.org.

PUB TYPE Information Analyses (070) -- Reports - Evaluative (142)

EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS

DESCRIPTORS *Adolescents; *Community Health Services; Early Parenthood; Environmental Influences; *Health Programs; Intervention; Predictor Variables; *Program Effectiveness; Program Evaluation; *Sex Education; Sexually Transmitted Diseases

ABSTRACT

There is an extensive body of research on the factors that are associated with reproductive health, focusing on factors within the adolescent as well as within the various components of the adolescent's environment. This paper presents a selective review of the research pertaining to each layer of the adolescent's ecosystem. Emphasized are (1) studies that are rigorously implemented, experimental evaluations of interventions, in which aspects of the environment are manipulated and reproductive health outcomes are examined; and (2) studies that are multivariate, involving the examination of aspects of the environment as predictors of reproductive health outcomes taking background characteristics into account. Throughout this paper, the aim is to go beyond the broad identification of which factors appear to be linked to adolescent reproductive health, to the identification of specific strategies that have been attempted and evaluated, and/or for which there is evidence that initiating programs with these activities has the potential to contribute to improved adolescent reproductive health outcomes. These studies indicate that interventions addressing the antecedents of adolescent pregnancy and STIs can be effective, with early childhood, youth development, community volunteer learning programs, and nurse home visiting approaches appearing as important complements to traditional sexuality and HIV education programs and clinic service approaches. (Contains 167 references and a research summary table.) (GCP)

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Background for Community-Level Work on Positive Reproductive Health in Adolescence: Reviewing the Literature on Contributing Factors

By
Jennifer Manlove, Elizabeth Terry-Humen, Angela Romano Papillo, Kerry Franzetta, Stephanie Williams & Suzanne Ryan

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Project Directors: Kristin A. Moore and Jonathan F. Zaff

December 2001

Prepared for the John S. and James L. Knight Foundation

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Acknowledgements
Several people helped with the creation of this report. We thank our external reviewer, Anne Driscoll from University of California - San Francisco and Davis for her comprehensive and thoughtful comments. We also thank Kristin Moore for comments on earlier drafts. We are also grateful for Thomson Ling's help with literature searches, technical assistance and copyediting. Finally, we want to express our gratitude to the Knight Foundation for their support of this project and, in particular, John Bare for his ongoing support and guidance.

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Introduction

Rates of unintended pregnancy and sexually transmitted infections are high in the United States and are highest among teens and young adults. In fact, despite declines in teen pregnancy rates in the 1990s, pregnancy and childbearing rates among teens are among the highest in the industrialized world (Singh & Darroch, 2000). The vast majority of teen pregnancies and births are unintended. For example, data from the mid-1990s show that 83 percent of pregnancies to 15 to 17-year-olds were classified as unintended (Henshaw, 1998). Seventy-five percent of pregnancies to 18- to 19-year-olds were unintended. Differential rates of unintended pregnancy among racial and ethnic minorities contribute to disparities in socioeconomic and health prospects of both parents and children.

The costs of adolescent childbearing are born by the teens themselves, by society as a whole, and particularly by the children of teen mothers. Estimates from the mid-1990s suggest an annual estimated cost of $6.9 billion per year associated with childbearing before age 18 (Maynard, 1997).

Like pregnancy, rates of sexually transmitted infections (STIs) among teens in the U.S. are also higher than STI rates among teens in other industrialized countries (Panchaud, Singh, Fevelson & Darroch, 2000). For example, the chlamydia rate is over 2000 among U.S. teen females (per 100,000 teens), compared with a rate of less than 1000 in Canada and less than 100 in Belgium and Switzerland (Panchaud et al., 2000). Rates among males are lower than among females but show similar patterns.

Improving adolescent reproductive health in the Unites States requires reducing unintended pregnancy and childbearing rates and reducing the incidence of STIs among teens. In order to reduce these negative health outcomes, it is important to examine antecedents of the sexual behaviors that lead up to them. Several components of positive reproductive health behaviors necessary to ultimately avoid an unintended pregnancy or contraction of an STI include:

- Delaying the timing of first sexual intercourse (also termed "sexual experience," "first sex," or "sexual debut");
- Reducing sexual activity among sexually experienced teens, including recent sexual intercourse and the incidence of multiple sexual partners;
- Improving the consistency and effectiveness of contraceptive use for pregnancy prevention and/or disease prevention.

Prevalence and Trends

Sexual Experience. A sexually experienced teen is an adolescent who has had sexual intercourse at least once in his or her lifetime. In 1999, about half of high school students in grades nine through twelve reported that they were sexually experienced, including 48 percent of females and 52 percent of male high school students (Terry & Manlove, 2000). The likelihood that teens have had sex increases sharply with age. For example, among females, 25 percent were sexually experienced by age 15, about half (52%) were sexually experienced by age 17, and more than three quarters (77%) were sexually experienced by age 19.

Trends in sexual experience among both male and female teens have shown declines in the 1990s. However, among female teens, there has been an increase in the proportion who have had sexual intercourse at an early age (before age 15) (Terry & Manlove, 2000).

Sexual Activity. Sexually active teens are defined as those who have had sex in the past three months. Not all teens who are sexually experienced are currently sexually active. Among high school males, more than half (52%) were sexually experienced in 1999; however, around a third (36%) were currently sexually active (Centers for Disease Control and Prevention, 1999). These percentages are similar for females. Sexual activity levels among high school teens have also shown declines in the 1990s.

Contraceptive Use. Different measures of contraceptive use show different trends over time. For example, research on contraceptive use among adolescents shows a dramatic increase in contraceptive use at first sex, among males and females. Data from the mid-1990s shows that more than three quarters of female teens (76%) use some contraceptive method at first sex, compared with less than half (48%) in the late 1980s (Terry & Manlove, 2000). The increase in contraceptive use among teens is due, primarily, to increases in condom use. However, national-level estimates show fairly constant rates of current contraceptive use in the past three months, and declines in contraceptive use at most recent sex among females (Terry & Manlove, 2000). This suggests that sexually active teens are not always acting on the message that avoiding pregnancy and STIs depends on consistent use of contraception.

Pregnancy and Childbearing. Rates of teenage pregnancy and childbearing declined steadily during the 1990s. Teenage birth rates in 2000 were 49 births per 1000 teens aged 15-19. This represents a record low in 2000, with declines shown among teens of all ages, racial/ethnic groups, and in all states and the District of Columbia. However, recent declines in adolescent childbearing were preceded by an equally dramatic *increase* in the U.S. teen birth rate in the late 1980s, so that recent rates are only slightly lower than pregnancy and birth rates in the mid-1980s (Moore, et al., 2001). Teenage pregnancy rates have also declined in the 1990s, which indicates that the decline in teenage childbearing is not due to an increase in abortions (Moore, Papillo, Williams, Jager, & Jones, 1999). Despite these declines, the United States birth rates remain among the highest of industrialized countries with birth rate information available (Singh & Darroch, 2000).

Sexually Transmitted Infections. Rates of sexually transmitted infections (STIs) are very high in the United States, especially among teens. In a comparison of STIs in developed countries, Panchaud et al. (2000) found that U.S. rates of gonorrhea and of chlamydia are among the highest in the developed world. Among females, teens have the highest rates of gonorrhea and chlamydia. Among males, who report much lower rates of STIs than females, those aged 20-24 have the highest rates (Moore et al., 1999). In a recent literature review, Whaley (1999), found that adolescents show a greater concern and awareness of pregnancy prevention than of disease prevention. However, improving contraceptive use and consistency is associated with positive health outcomes.

Methodology

There is an extensive body of research on the factors that are associated with reproductive health, focusing on factors within the adolescent as well as within the various components of the adolescent's environment (e.g., family, peers, schools, neighborhood, and broader social policy context). In this paper, we present a selective review of the research pertaining to each layer of the adolescent's ecosystem. We emphasize (1) studies that are rigorously implemented, experimental evaluations of interventions, in which aspects of the environment are manipulated and reproductive health outcomes are examined; and (2) studies that are multivariate (cross-sectional or longitudinal), involving the examination of aspects of the environment as predictors of reproductive health outcomes taking background characteristics into account. [1]

We also highlight studies that have been replicated with similar results across different populations and geographic regions. Successful interventions appear to have a better chance of being replicated in additional locations than do studies that have been carried out only in a single place, at one single point in time.

There are limited experimental studies on antecedents of reproductive health, and most are concentrated in the area of pregnancy prevention programs. In addition, several multivariate analyses of secondary data rely on cross-sectional data or retrospective reports, and do not allow researchers to determine causality. In these cases, we discuss the association between various measures and multiple reproductive health outcomes instead of discussing what factors predict outcomes.

Since the focus of this paper is on adolescents, we have further restricted studies to those that measure outcomes during adolescence. Therefore, studies that have outcome data only among younger children or adults are not considered. However, we do include longitudinal studies that begin in childhood and continue into adolescence. Also, when little or no information exists for a certain topic, we have included national-level statistics for adults that are suggestive of effects on adolescents (i.e., sexually transmitted infections).

Throughout this paper, our aim is to go beyond the broad identification of which factors appear to be linked to adolescent reproductive health, to the identification of specific strategies (the kinds of programs and activities within these programs) that have been attempted and evaluated, and/or for which there is evidence that initiating programs with these activities has the potential to contribute to improved adolescent reproductive health outcomes. Due to the criteria we set for our selected literature review, we may not have identified all programs and activities across the country that may be effective in promoting positive adolescent reproductive health.

We have summarized these findings in a "What Works" table at the end of the report. In this table, those approaches that have been evaluated using randomized experimental designs and shown to impact reproductive health outcomes are placed in the "what works" column. Those approaches that have been evaluated with similar rigor but have found no impact have been

[1] These criteria for study inclusion in the present report were culled from a review of school readiness written for the John L. and James S. Knight Foundation (Halle, Zaff, Calkins, & Margie, 2000).

placed in the "what doesn't work" column. The "mixed reviews" column is for approaches that have been experimentally evaluated, but the results are conflicting. Finally, we include promising approaches that have been informed by rigorous non-experimental studies in the "best bets" column. Although we cannot conclude causality with non-experimental studies, we believe that these studies can still provide important insight to funders, practitioners and program developers.

The following literature review shows that multiple domains in an adolescent's life are associated with reproductive health outcomes. We incorporate an ecological approach and demonstrate that individual, family, school, community, and social policy characteristics are all associated with sexual behaviors, adolescent pregnancy, and STI. Identifying factors associated with reproductive health behaviors will help determine best bets for programs to reduce unintended pregnancy and STIs. This literature review also includes a summary of program evaluations targeted to preventing early and unwanted pregnancy and childbearing.

Individual Factors

Adolescent biological characteristics (age, gender, race/ethnicity), behaviors, activities and attitudes are all associated with positive reproductive health.

Menarche/Puberty

Multiple studies have shown an association between an early age at puberty and early timing of first sexual intercourse among males and females and all racial/ethnic groups (Benson & Torpy, 1995; Capaldi, Crosby, & Stoolmiller, 1996; Miller, Norton, et al., 1997; Meschke, Zweig, Barber, & Eccles, 2000; Brewster, Cooksey, Guilkey, & Rindfuss, 1998). Miller et al. (1997) examined a nationally representative sample of non-Hispanic adolescent females and males from the 1970s through the 1980s and found that an earlier age at menarche was associated with earlier onset of first sexual intercourse for white and black females. With a longitudinal sample of white teens from Michigan from 1983 through 1993, Meschke et al. (2000) also found that an earlier age at menarche/puberty was associated with an earlier age at first sex among males and females.

Using respondents from a nationally representative survey of school-age teens, Resnick et al. (1997) found that adolescents who reported looking older than their peers were more likely to have an earlier age at sexual debut. Physical maturity was also associated with an increased likelihood of early sexual intercourse among a sample of males in grades 7 –12 residing in Oregon and at risk for delinquency in the 1980s (Capaldi et al., 1997).

Age

Researchers have shown that the likelihood of sexual intercourse increases with age (Raine et al., 1999; Miller, Norton, et al., 1997 (females only); Brewster et al., 1998; Santelli, Lowry, Brener, & Robin 2000; Jaccard, Dittus, & Litardo, 1999). Further, a younger age at first sexual intercourse is associated with many negative sexual consequences among male and female teens, including a greater likelihood of having nonvoluntary or unwanted sex (Moore et al., 1998), having multiple sexual partners (Smith, 1997) and a greater risk of having a teen birth

(Manlove, Terry, Gitelson, Papillo, & Russell, 2000; Smith, 1997; Thornberry, Smith & Howard, 1997).

In addition, researchers consistently find that as teenagers age, the likelihood of various sexual behaviors increases, such as frequency of sexual intercourse (Benda & Corwyn, 1996; Afxentiou & Hawley, 1997; Ku et al., 1998; Smith, 1997; Miller, Forehand, & Kotchick, 1999), number of lifetime sexual partners (Holtzman & Rubinson, 1995; Benda & Corwyn, 1996; Smith, 1997; Miller, Forehand, et al. 1999), and number of sexual partners in the last year (Benda & Corwyn, 1996).

The number of years of sexual intercourse an adolescent reports strongly predicts their number of lifetime sexual partners (Shrier, Emans, Woods, & DuRant, 1996). In a study of two nationally representative samples, Santelli, Brener, Lowry, Bhatt & Zabin (1998) show that early sexual debut relates to multiple recent sexual partners and having had six or more lifetime partners. For example, in the study, a young woman who had sex for the first time before age 14 is more than twice as likely to have had multiple recent sexual partners compared with a young woman who had sex for the first time at age 16 or later (Santelli et al., 1998).

Although U.S. teenagers are not consistent contraceptive users as a whole, some studies have found that the likelihood a teen will use any form of contraception increases with age (Mauldon & Luker, 1996; Manning, Longmore, & Giordano, 2000). An older age is also associated with a greater likelihood of using contraception at most recent intercourse among a national sample of males and females (Santelli et al., 2000). Smith (1997) found that among a nine-wave panel study of urban minority teenagers, both males and females who had their sexual debut at age 16 or older were more likely to use condoms regularly than their counterparts who had first sex at age 15 or earlier. Brewster et al. (1998) found an association between age and a greater likelihood of pill use (compared with using condoms) in a national sample from the 1980s. Nevertheless, other studies show different results. Two different studies using the same 1993 sample of adolescents in Massachusetts, found that older adolescents, females, adolescents who have more years of sexual intercourse, and adolescents who report using greater amounts of marijuana and cocaine are more likely to report not using a condom at their most recent intercourse (Shrier et al., 1996), and that older age is associated with males being involved with a pregnancy (Spingarn & DuRant, 1996). Miller, Forehand, et al. (1999) found that age was negatively associated with regular condom use among a sample of black and Hispanic teens in Alabama, New York City, and San Juan, Puerto Rico from the 1990s.

Studies of sexually transmitted infections in an adolescent population are scarce. However, research on women of childbearing age provides some insight into the association of individual characteristics with STIs. Younger individuals are at a greater risk for STDs than older individuals (Finer, Darroch, & Singh, 1999). Compared to older women, young adults aged 15-24 are more likely to report having been treated for Pelvic Inflammatory Disease (PID) (Miller, Cain, Rogers, Gribble, & Turner, 1999). The older a woman was at her first intercourse, the less likely she was to have had a bacterial STD (Miller, Cain, et al., 1999). Panchaud, Singh, Feivelson, & Darroch's (2000) cross-national comparison of syphilis, gonorrhea and chlamydia trends among adolescents and young adults support these findings. Their evidence shows that these STDs are disproportionately present among young people (adolescents aged 15-19 and young adults aged 20-24), with these age groups accounting for between one-fifth and one-third of all reported cases of the diseases. The incidence rates are generally higher among young adults than among adolescents because a greater proportion of young adults engage in sexual activities, putting them at risk of an STD (Panchaud et al., 2000). Fortunately, younger women

are also more likely to report using condoms for STD prevention than other women (Finer et al., 1999).

Gender

Studies have consistently found that males are more likely to be sexually experienced, to have more sexual partners both in the past year and in their lifetime, and to have sex more frequently than females (Raine et al., 1999; Benson & Torpy, 1995; Mott, Fondell, Hu, Kowaleski-Jones, & Menaghan, 1996; Benda & Corwyn, 1996). Adolescent females have higher STD rates than males, perhaps because their diseases are more likely to be detected since they more frequently see doctors for reproductive health care than do males. Alternately, their risks might in fact be higher because they often engage in sexual relationships with older males and older partners are more likely to be infected (Panchaud et al., 2000). Gender also makes a difference in discussions about HIV. In a nationally representative study from 1989, Holtzman and Rubinson (1995) found that males who discussed HIV with their peers are more likely to report having multiple lifetime sexual partners while females who discussed HIV with parents or other adult family members were less likely to report multiple sexual partners.

Race/Ethnicity

Various studies have found that race is a significant factor in predicting adolescent sexual behavior or health outcomes. Researchers using nationally representative surveys have shown associations between race/ethnicity and ever had sex, timing of first sex, frequency of sex, contraceptive use, and births (Abma & Sonenstein, 2001).

Results from nationally representative samples of adolescents have demonstrated that black teenagers are more likely to have ever had sexual intercourse than non-black teenagers (Mott et al., 1996; Santelli et al., 2000). Studies of adolescents in two urban areas report that blacks are between two and four times more likely to have lost their virginity than non-Hispanic whites (Benson & Torpy, 1995; Widmer, 1997). Not only are black teens more likely to be sexually active, but also they are more likely to have experienced first sex at an earlier age than both Hispanic and non-Hispanic white teens (Afxentiou & Hawley, 1997; Smith, 1997). Interestingly, however, an opposite pattern emerges for frequency of intercourse -- blacks appear to engage in sex less frequently than non-black teens (Ku et al., 1998).

Data from nationally representative samples indicates that racial/ethnic differences also exist with respect to adolescent contraceptive use. Non-Hispanic white females are more likely to use any form of contraception at first intercourse than Hispanic or black females (Manning et al., 2000; Mauldon and Luker, 1996). But, blacks are more likely to use the pill at first intercourse than non-Hispanic whites.

The evidence from national surveys of women aged 15 or older suggests that, although non-Hispanic black women are more likely to report using condoms for STI prevention than other women, they are still more likely to be at a direct risk for STIs (Finer et al., 1999; Miller et al., 1999). In fact, after controlling for age, education, age at first intercourse, IUD use, and douching, black women are almost twice as likely as white women to have had a bacterial STI (Miller et al., 1999). Blacks and Hispanic adolescents have higher gonorrhea rates than non-Hispanic whites (Panchaud et al., 2000). The syphilis rate is highest for black teens, followed by Hispanic and then non-Hispanic whites (Panchaud et al., 2000). A study of 466 men with STIs suggests that black men react more responsibly to an STI diagnosis than do white men (Payn, Tanfer, Billy, & Grady, 1997). Black men were less likely than white men to continue to have

sex while infected. Also, after learning of their infection, blacks were more likely than whites to start using condoms as protection.

Lastly, race/ethnicity is significantly associated with becoming a teenage parent. Among sexually experienced teenage girls, non-Hispanic blacks and Hispanics are more likely to have a teen birth than non-Hispanic white teenagers (Afxentiou & Hawley, 1997; Manlove et al., 2000). For males, both blacks and Hispanics have a greater likelihood of becoming teenage fathers than white teens (Thornberry et al., 1997). The effect of race was diminished but not removed when controlling for parent's age at first birth, parental education, parent's college expectations for the youth respondent, early sexual intercourse and drug use.

In sum, non-Hispanic white youth tend to have a lower risk of sexual initiation, are more likely to use any form of contraception at first sex, and are less likely to be involved in a teen birth than black or Hispanic teens.

Sexual Abuse

Research on sexual abuse relies on retrospective reports of abuse and on reproductive health. Studies of sexual abuse among teens show an association between abuse experiences and the timing of first intercourse, number of sexual partners, contraceptive use, and reports of pregnancy among adolescent and young adult females. For example, females with a history of sexual abuse are more likely than non-abused females to have initiated sex at a younger age (Miller, Monson, & Norton, 1995; Nagy, DiClemente, & Adcock, 1995; Raj, Silverman, & Amaro, 2000; Stock, Bell, Boyer, & Connell, 1997; Moore, Peter, & Nord, 1989), to report having multiple lifetime partners (Raj et al., 2000; Stock et al., 1997) and to report multiple partners in the past year (Luster & Small, 1997). Sexually abused females are also less likely to report using contraception at last sex (Stock et al., 1997) and are more likely to report having ever been pregnant (Nagy et al., 1995; Raj et al., 2000; Stock et al., 1997).

Among adolescent males, those who reported having experienced unwanted sexual advances in the past 12 months were more likely to have had sexual intercourse (Marin, Coyle, Gomez, Carvajal, & Kirby, 2000). Males with a history of sexual abuse are also more likely to have had multiple lifetime partners, to have had multiple sex partners in the past 3 months, and to have engaged in sex resulting in pregnancy (Raj et al., 2000).

Risk-Taking

Risk-taking behaviors, such as substance abuse, delinquency and sexual risk behaviors are associated with reproductive health behaviors among adolescents. Adolescents who report substance use (including smoking, alcohol and drug use) are more likely to be sexually experienced (Boyer, Tschann, & Shafer, 1999; Costa, Jessor, Donovan, & Fortenberry, 1995; Harvey & Spigner, 1995; Kowaleski-Jones & Mott, 1998; Middleman, Faulkner, Woods, Emans, & DuRant, 1995; Millstein & Moscicki, 1995; National Center on Addiction and Substance Abuse, 1999; Pierre, Shrier, Emans & DuRant, 1998). Sexually experienced male and female adolescents are more likely to engage in problem or risky behaviors such as substance use, drunk driving or riding in a car when the driver has been drinking, not using seat belts, missing school, getting into a physical fight (Harvey & Spigner, 1995; Kowaleski-Jones & Mott, 1998) and to run away (Kowaleski-Jones & Mott, 1998). Men who participate in risk behaviors are less likely to protect themselves against STIs (Forste and Morgan, 1998).

Several studies have shown an association between early sexual initiation and involvement in antisocial/delinquent behavior and substance use (Kinsman, Romer, Furstenberg,

& Schwarz, 1998; Mott et al., 1996; National Center on Addiction and Substance Abuse, 1999; Smith, 1997; Weinbender & Rossignol, 1996). A longitudinal study of at-risk male adolescents in Oregon shows that teens who initiate sexual intercourse in grades 7-8 display greater antisocial/delinquent behavior, exhibit higher levels of substance use in adolescence, and have arrest rates almost double those of their peers who initiate sexual intercourse in grades 9-11 (Capaldi et al., 1996). Among white adolescents, greater participation in and tolerance of deviance, and having relatively more friends who engage in problem behaviors are associated with an earlier age of sexual initiation (Costa, et al., 1995).

Multiple studies also illustrate an association between substance use and risky sexual behaviors. Alcohol and drug use among adolescents and their friends is related to nonuse of condoms and birth control (Kowaleski-Jones & Mott, 1998; Middleman et al., 1995; Shrier et al., 1996), putting teens at risk of pregnancy and STIs (Boyer et al., 1999; Middleman et al., 1995). Use of alcohol and illicit drugs also is associated with a higher probability of adolescents having had multiple sexual partners (Middleman et al., 1995; Millstein & Moscicki, 1995; National Center on Addiction and Substance Abuse, 1999; Santelli et al., 1998; Shrier et al., 1996; Valois, Oeltmann, Waller, & Hussey, 1999). For male teens, daily cigarette use and frequency of cocaine and alcohol use are linked to a greater likelihood of involvement in a pregnancy (Guagliardo, Huang & D'Angelo, 1999; Pierre et al., 1998; Spingarn & DuRant, 1996).

Joint occurrences of sex and substance use also correlate with more risky sexual behaviors. Using a nationally representative sample from 1992, Santelli, Robin, Brener, and Lowry (2001) demonstrated an association between substance use concurrent with sex and a decrease in condom use at last sex and an increase in recent sexual partners (Santelli et al., 2001). A cross-sectional study of homeless adolescents in Washington, DC shows that those adolescents who reported using a substance during their most recent sexual encounter were more likely to have been with a casual, new, or onetime sexual partner than were adolescents who did not report substance use (Bailey, Camlim & Ennett, 1998). The likelihood of engaging in joint sex and substance use is influenced by adolescents' views of the practice. Not surprisingly, a study of women between the ages of 14 and 19 recruited from urban and suburban family planning clinics found that adolescent females who had a more favorable view of using substances while engaging in sexual activities were more likely to report such joint behaviors (Millstein & Moscicki, 1995).

Finally, the research literature provides evidence of a relationship between physical violence and adolescent sexual behaviors. Male teens' involvement in physical fights is associated with sexual experience (Harvey & Spigner, 1995), a younger age at first sex (Miller, Norton, et al., 1997), and impregnating someone (Spingarn & DuRant, 1996). Teens who have a greater number of sexual partners are more likely to be involved in physical fighting, carrying a weapon, and dating violence (Valois et al., 1999). Adolescents who are involved in teenage pregnancy, especially males, are also more likely to be involved in other risk or delinquent behaviors such as being inconsistent condom users, having an STD history, drinking and driving, car theft, breaking and entering, strong-arming, attacking to seriously hurt or kill or rape (Guagliardo et al., 1999; Millstein & Moscicki, 1995; Pierre et al., 1998; Spingarn & DuRant, 1996; Stouthamer-Loeber & Wei, 1998). Those who become fathers are more likely to belong to a gang (Thornberry et al., 1997) or to commit property offenses than their peers who do not become fathers (Stouthamer-Loeber & Wei, 1998). However, comparing teen parents to non-parents in a nationally representative sample, Kowaleski-Jones and Mott (1998) show that

adolescents who have a child are marginally less likely than their peers without children to express a desire to take risks in the future.

Educational Engagement (Grades, Test Scores, Dropout)

Factors relevant to teens' school experiences, including high levels of school engagement, are associated with the risk of pregnancy leading to a live birth among a national sample of white, black, and Hispanic high school-age teens (Manlove, 1998). Among white and Hispanic teens, dropouts – especially young dropouts – were more likely to have a school-age pregnancy, net of other family and educational factors. Although African American teens did not show a relationship between dropping out and the risk of pregnancy, other measures of educational performance and aspirations were important risk factors for this group (Manlove, 1998). Similarly, in a study of nonmarital school-age motherhood, Moore, Manlove, Glei, & Morrison (1998) found that educational performance and school characteristics were associated with the risk of a nonmarital teen birth. In a nationally representative sample of youth in grades 7 through 12, Resnick et al. (1997) also found that adolescents who reported higher grade point averages in school were less likely to have an early age at sexual debut.

Grades are also positively associated with the likelihood of using any form of contraception at their first sexual intercourse. Using recent national data, Manning et al. (2000) found that sexually experienced females who had lower grades were less likely to use any form of contraception at first intercourse than females who had average grades. Further, lower grades were associated with a greater likelihood of using the pill (versus a condom) at first intercourse and of using some 'other' method of contraception (versus a condom) (Manning et al., 2000).

Teens with higher educational aspirations have more positive reproductive health outcomes. Using the 1982 NLSY, Afxentiou and Hawley (1997) found that the more years of schooling that a female teen expected to complete was associated with a lower likelihood that she would be sexually experienced. In addition, among sexually experienced teens, those with higher educational expectations were less likely to have a birth. Smith (1997) examined a sample of urban minority youth and found that, for female teenagers, higher school aspirations were associated with a lower likelihood of early sexual activity.

Two studies found that academic attainment was associated with teenage fatherhood among urban males. Thornberry et al. (1997) showed that teenage males with higher reading scores had a lower likelihood of becoming fathers than teenage males with lower reading scores. On similar lines, Stouthamer-Loeber & Wei (1998) examined a subsample of young urban males from Pittsburgh public schools and found that males who were old for their grade were more likely to become young fathers (before age 19) than males who were average age for their grade.

Sports

For female adolescents, participation in sports has been shown to have a delaying effect on initiation of first intercourse, to lower the frequency of sexual intercourse, and to decrease the number of lifetime sexual partners (Miller, Sabo, Farrell, Barnes, & Melnick, 1998; Sabo, Miller, Farrell, Barnes, & Melnick, 1998). Participation in sports increases the likelihood of using contraception among both male and female adolescents (Miller, Sabo et al., 1998) and reduces the likelihood of a female adolescent getting pregnant (Sabo et al., 1998).

Religiosity

Religiosity has been shown to positively influence adolescent sexual behavior through its associations with decreased likelihood of sexual initiation, teen pregnancy, and teen birth. Several studies show that male and female adolescents who regularly attend church are less likely to be sexually experienced at a young age (Halpern, Joyner, Udry, & Suchindran, 2000; Afxentiou & Hawley, 1997) and, among females, are less likely to have a teenage birth (Manlove et al., 2000). Male and female adolescents who attend church regularly and have peers attending the same church are significantly more likely to delay sexual initiation than their counterparts who do not attend church (Mott et al., 1996). In addition, female teens who report they like to attend religious services also are less likely to have sexual intercourse at an early age (Miller, Norton, et al., 1997).

Adolescents who place higher levels of importance on religion and prayer are at a lower risk of early sexual initiation (Lammers, Ireland, Resnick & Blum, 2000; Resnick et al., 1997) and are less likely to have frequent sexual intercourse (Benda & Cowyn, 1996). However, in their study, Ku et al. (1998) observed a positive relationship between religiosity and sexual experience. They found that adolescent males who place high importance on religious and moral beliefs were significantly more likely to have had sex in the four weeks prior to the survey interview.

Religious affiliation has been found in some studies to be related to adolescent sexual behavior. Bearman and Brückner (1999) found that Catholic and conservative Protestant adolescents are less likely to be sexually experienced or to get pregnant than are mainstream Protestants. A study of Seventh-Day Adventists showed that a variety of behaviors are associated with early sexual initiation among Adventist adolescents. These behaviors include drug and alcohol use as well as several behaviors that are discouraged within Adventist culture but are considered acceptable among popular culture in the US, such as going to a movie theater and participating in competitive sports (Weinbender & Rossignol, 1996). While religious affiliation does seem to have some influence, the bulk of the literature suggests that religiosity is a more important factor.

Knowledge of Reproductive Health

Various studies have shown relationships between sexuality education and an increased likelihood of using contraception at first intercourse and a decrease in the frequency of intercourse among adolescents. Using data from the 1980s, Mauldon and Luker (1996) found that female teenagers who had contraceptive education before having first intercourse were more likely to use a contraceptive method at first sex. If this contraceptive education occurred in the same year as (and before) initiation of first sexual intercourse, teens had an even greater likelihood of using a contraceptive method at first sex. More recent data from the 1990s show similar findings. Females who received birth control education prior to sexual debut were more likely to use any form of contraception at first sex than females who did not (Manning et al., 2000).

In a survey of metropolitan males ages 17-19, Ku et al. (1998) found AIDS education was associated with a decrease in recent sexual activity among non-black youth but not among black youth. In addition, having received AIDS education was associated with less frequent sexual activity among non-black youth (Ku et al., 1998).

Nevertheless, Benson and Torpy (1995) examined students from a sample of junior high schools in Chicago and did not find a significant association between an adolescent's knowledge about sex and virginity loss.

Attitudes and Beliefs About Sex

Attitudes and beliefs about sex influence the reproductive health behaviors of adolescents in a number of ways. Having attitudes that favor postponing the initiation of sexual intercourse is positively associated with delaying the onset of sexual intercourse (Carvajal et al., 1999; Lock & Vincent, 1995; Ku et al., 1998; Miller Norton, Fan & Christopherson, 1998). Adolescents with higher sexual abstinence values tend to have higher communication quality with their parents about issues related to sex and sexuality and reduced sexual activity among females, but not males (Miller, Norton, et al., 1998).

Perceptions of peer behaviors and attitudes are associated with adolescent sexual activity, however, in many cases, teens select peers with similar sexual attitudes and behaviors, so it is difficult to determine causality. In one study, perceptions that other boys are having sex are significant predictors of engaging in sexual intercourse for males (Robinson, Telljohann, & Price, 1999). Using a national, longitudinal sample, Miller, Norton, et al. (1997) show that the number of friends adolescents think have had sex at age 16 increases the risk of having sex for males and is a significant predictor of age at first sexual intercourse for females. Similarly, in a longitudinal study, Kinsman et al. (1998) find that adolescents who have initiated sexual intercourse are more likely to report that "most friends" are sexually experienced and have lower perceptions about the normative age for initiating sexual intercourse than are adolescents who are sexually inexperienced. Adolescents who report believing that most of their peers have had sex are more likely to report having a high intention to initiate sexual intercourse in the coming year (Kinsman et al., 1998). For example, non-white males believe that more students have initiated sexual intercourse by the end of the eighth grade than do White males, and non-White males intend to delay sexual debut less than White males, Black females, or White females (Robinson et al., 1999).

In a longitudinal survey of sixth-grade students in public school in Philadelphia during the 1994-1995 school-year, intention to initiate sexual intercourse was a stronger predictor of sexual initiation in the sixth grade than demographic characteristics, individual risk behaviors, peer risk behaviors, and peer norms (Kinsman et al., 1998). Adolescents with a high intention to initiate sexual intercourse in the coming year are significantly more likely to report believing that a sexually experienced girl would gain respect than are adolescents with a low intention to initiate sexual intercourse. Adolescents who initiated sexual intercourse are more likely to report believing that boys who are sexually experienced gain respect compared to adolescents who did not initiate sexual intercourse, who are more likely to report believing that sexually experienced boys would be stigmatized or lose respect (Kinsman et al., 1998). Males and Hispanic females who perceive personal and social benefits to sex are more likely to have had sex than those perceiving personal or social costs to sex (Blum, Beuhring & Rinehart, 2000).

Having high confidence in one's ability to refrain from having sex in specific situations is positively related to delaying the onset of sexual intercourse in a longitudinal study of urban, southwestern youth from 1993-1995 (Carvajal et al., 1999).

Some adolescents make written or public virginity pledges to express their beliefs about sexual activity, and those teens who sign pledges have different sexual behaviors than those teens who do not. Adolescents who report taking a pledge to remain a virgin are at a lower risk

of an early age of sexual initiation (Resnick et al., 1997; Bearman & Brückner, 2001). Having made a written or public virginity pledge is associated with not having had sex among minority males and black females (Blum, Beuhring & Rinehart, 2000), and pledging significantly delays intercourse for the majority of pledgers in early and middle adolescence (Bearman & Brückner, 2001). Making a virginity pledge protects against sexual initiation as long as the pledge is made within a minority community of pledgers in a school where social relations are, for the most part, confined in the school. However, making a virginity pledge in this sort of environment loses its protective nature when the percentage of pledgers in a socially-closed school increases, and pledging, in effect, becomes normative (Bearman & Brückner, 2001). Also, pledgers are one-third less likely to use contraceptives if they do initiate sexual intercourse (Bearman & Brückner, 2001).

Contraceptive use, pregnancy history and concerns about sexually transmitted infections are related to one's attitudes and beliefs about sex. For example, values regarding nonmarital pregnancy have changed over time. Adolescent males have become less likely to support marriage as a solution for a nonmarital pregnancy over time (Ku et al., 1998). Those teens who perceive negative consequences of becoming pregnant are less likely to become pregnant (Resnick et al., 1997). In addition, adolescents who perceive a higher risk for STD and AIDS are more likely to be sexually experienced (Boyer et al., 1999). For example, sexually experienced males are more likely to worry about the spread of AIDS than their sexually inexperienced counterparts (Harvey & Spigner, 1995).

Summary: Individual Factors

Individual characteristics have important influences on reproductive choices and behaviors. Males report more sexual activity than females. Compared to African American and Hispanic teens, non-Hispanic whites tend to exhibit more positive reproductive behaviors. As adolescents age, they are more likely to engage in sexual intercourse and more likely to use contraception. Youth who experience early physical maturation face an increased likelihood of early sexual initiation.

Teens who do well in school, have higher educational aspirations, and express strong religiosity have more positive reproductive health outcomes. For girls, participation in sports also influences their sexual behaviors in a beneficial way. In contrast, teens who participate in risk-taking behaviors such as substance abuse and delinquency are more likely to take risks in the sexual behavior arena as well. For example, they tend to initiate sex at younger ages, rely less upon contraception and experience higher rates of pregnancy. In addition, teens with a history of sexual abuse are more likely to be sexually active and less likely to practice healthy sexual behaviors.

Increasing adolescents' knowledge about abstinence, contraception, and AIDS is important because youth who know more are more likely to use contraception and less likely to be sexually active. Lastly, while signing virginity pledges may help teens to delay sexual debut, the perception that sexual experience elicits respect from peers is often an impetus to initiate sex for many teens.

Family Factors

The family is an integral part of most adolescent's lives. This section looks at various family factors from socioeconomic risk to family structure to parenting variables and finds that many aspects of the family are associated with teen reproductive health outcomes.

Family Socioeconomic Status

Multiple studies have shown an association between family socioeconomic status (SES) and sexual behavior among adolescents. Measures of family SES include family/household income, parental employment, and parental education.

Adolescents from families with higher incomes are less likely to be sexually experienced, more likely to use contraception and less likely to have a teen pregnancy or birth than other teens (Mayer, 1997; Miller, 1998; Brindis, Pagliaro, & Davis, 2000). Using national-level data from the 1990s, Afxentiou and Hawley (1997) found that never-married teenagers who came from households with higher incomes were less likely to be sexually experienced and, if sexually experienced, were less likely to have a birth. Longitudinal analyses of a large state sample of 7th to 12th grades also shows that living in households with higher SES levels is a protective factor against initiation of sexual activity for both males and females (Lammers et al., 2000). However, a longitudinal study of high-risk adolescents indicates that adolescents whose mothers worked a higher number of hours while they were growing up were more likely to initiate first sex by age 14 than adolescents whose mothers worked fewer hours (Mott et al., 1996).

Parental education is another component of SES that is associated with adolescent sexual behaviors. Higher maternal education is associated with less frequent acts of intercourse in a sample of metropolitan males ages 17-19 (Ku et al., 1998) and with a lower likelihood of ever having sexual intercourse among a national sample of male and female adolescents aged 14-17 (Santelli et al., 2000), among a national sample of females aged 15-19 (Brewster, 1994a) and among females in a sample of white females and males in Michigan (Meschke et al., 2000). However, after controlling for individual and social context variables, the effects of maternal education lost significance in some models (Santelli et al., 2000; Meschke et al., 2000).

Parent education levels are also associated with contraceptive use at first intercourse. Nationally representative samples of female teenagers show that higher levels of parental education are associated with a higher probability of using any form of contraception at first sex (Manning et al., 2000; Mauldon & Luker, 1996). National-level data also indicate that female adolescents across multiple time periods with mothers who were more educated had a reduced likelihood of having a teenage birth (Manlove et al., 2000; Afxentiou & Hawley, 1997). Urban male teens with more educated parents also show a reduced likelihood of becoming a teenage father than teens who had less educated parents (Thornberry et al., 1997), and women between the ages of 18 and 22 living in Arizona whose mothers had at least a high school degree are less likely to have been pregnant (Roosa, Tein, Reinholtz, & Angelini, 1997).

Family Structure Risk

Adolescents living in a two-parent family have less risky reproductive behaviors, due in part to higher household income and higher levels of monitoring. In addition, parents in stable two-parent households are presumably unlikely to provide a model of nonmarital sex and dating (McLanahan & Sandefur, 1994).

National-level studies from the 1990s show that male and female teens living in two-parent families had a later age at first sex and were less likely to be currently sexually active (Moore, Morrison, & Glei, 1995a; Afxentiou & Hawley, 1997; Santelli et al., 2000). Several

studies show that having married parents is a significant predictor of later timing of first intercourse for white females (but not males) (Meschke et al., 2000), for a sample of 7th to 12th grade students in Minnesota public schools (Lammers et al., 2000), and that living with both biological parents is associated with a reduced likelihood of early initiation of sexual activity among urban minority youth (Smith, 1997). In addition, in a sample of metropolitan males aged 17-19, growing up in a household with both a mother and father was associated with less frequent intercourse (Ku et al., 1998).

Alternatively, among sexually experienced adolescent females younger than age 18 in a national sample, living in a step-parent family is associated with a reduced likelihood of using any contraception at first sex compared with living with two biological parents (Manning et al., 2000). Female adolescents who lived in single-parent households were more likely to use the pill (versus a condom) at first sex than teens in a two-parent household (Manning et al., 2000). Living in a two-parent family is also associated with a reduced likelihood of teen parenthood among females and males (Afxentiou & Hawley, 1997; Haveman, Wolfe & Wilson, 1997; McLanahan & Sandefur, 1994; Stouthamer-Loeber & Wei, 1998).

Turbulence or changes in living situation are also associated with reproductive health behaviors. Higher levels of family disruption and instability, reflected by changes in parents' marital status, are associated with nonmarital childbearing by young adults (Wu & Martinson, 1993; Wu, 1996). This relationship is not simply an artifact of socioeconomic differences by family structure; instead, the relationship remains robust even in the presence of controls for family income (Wu, 1996). Moore, Morrison, and Glei's (1995b) study of adolescents aged 11 to 17 found that those who experienced their parents' marital disruption had a significantly greater risk of transitioning to first sex than adolescents not experiencing family disruption. Using longitudinal analyses, Capaldi et al. (1996) showed that adolescent boys at risk for delinquency who experienced more parental transitions (marital and nonmarital) had a greater likelihood of early sexual debut than boys from stable households. Miller, Norton, et al. (1997), using a national data set, also found that male teens whose parents had a greater number of changes in marital status were more likely to have first sexual intercourse at an early age.

Intergenerational Trends

Several studies indicate that there are intergenerational patterns of early sexual experience and childbearing. For example, a national study of children born to young mothers shows that an earlier age of maternal first sex was associated with a greater likelihood that adolescent male and female children would have their sexual debut by age 14 (Mott et al., 1996). Teenagers in a Philadelphia survey who had mothers that were younger at their first birth were also more likely to have initiated sexual activity than adolescents whose mothers were older at their first birth (Widmer, 1997).

Having a mother who was a teenager at her first birth was associated with an increased likelihood that females in three cohorts of teenagers from a national survey would have a teenage birth themselves (Manlove et al., 2000). Using a panel study sample of urban males, Thornberry et al. (1997) also found that male teenagers who had parents who were younger at first birth had an increased likelihood of becoming a teenage father themselves.

Siblings

Adolescents growing up in families with a greater number of siblings are more likely to have sex at an early age. Mott et al. (1996) found that number of siblings is not related to age at

first intercourse among a sample of adolescent children of young mothers. Miller (1998) reports that other researchers have found that having a large number of siblings is positively related to the probability of sexual initiation. Benson and Torpy (1995) found that number of siblings was positively associated with early sexual intercourse among male and female middle school students, and Blum, Beuhring and Rinehart (2000) found that having a larger number of siblings was associated with decreased likelihood of sexual experience among black adolescent females.

Research on siblings has shown that the sexual behavior of older brothers and sisters is associated with sexual behaviors among younger siblings. For example, males and females with a sexually experienced older brother are more likely to initiate sexual intercourse at an early age (Widmer, 1997; Miller 1998). In addition, Moore et al.'s (1995a) review of the literature on adolescent reproductive behavior highlights the positive correlations researchers have found between the ages of first intercourse for older and younger siblings.

Adolescent girls with an older sister who gave birth as an adolescent perceive younger ages as appropriate for first intercourse and are more accepting of adolescent childbearing (East, 1996a; East, 1996b), while younger brothers of pregnant and parenting teens are more accepting of nonmarital childbearing, ascribe more importance to childbearing and perceive fewer problems related to early childbearing (East, 1996b). Females and males with multiple parenting sisters have an increased likelihood of being sexually experienced, while females, but not males, with multiple parenting sisters have more permissive sexual and childbearing attitudes (East & Kiernan, 2001). Research has also documented that having an older sister who was pregnant or has given birth is associated with higher rates of intercourse for adolescents of both genders (East, 1996b; East & Kiernan, 2001; Miller, 1998).

Parenting

Parent-Child Communication, Relationship with Parents

Numerous studies show that parent-teen communication, in general, and communication about reproductive health, in particular, are associated with teens' sexual outcomes. In a national sample of minority teens, Miller, Forehand et al. (1999) found that general parent-child communication was associated with a lower frequency of intercourse and fewer sexual partners.

Several studies indicate that strong parent-adolescent emotional connections and participating in shared activities with parents are associated with later adolescent sexual debut and a lower likelihood of pregnancy, among males and females and multiple racial/ethnic groups (Bearman & Bruckner, 1999; Miller, Norton, et al., 1997; Resnick et al., 1997; Smith, 1997). Alternatively, adolescents with negative feelings towards their parents were more likely to have an early age of sexual debut. The benefits of parent-child ties seem to operate even through peer connections. Even if an adolescent did not have a good relationship with her own parents, if her friends had close connections with their parents, she was only half as likely to experience sexual debut (Bearman & Bruckner, 1999). Both perceived maternal disapproval of premarital sex and a high level of satisfaction with the mother-adolescent relationship are associated with delayed sexual initiation, increased contraceptive use, less frequent sexual intercourse and a lower likelihood of pregnancy (Dittus & Jaccard, 2000; Jaccard, Dittus, & Gordon, 1996).

Specific parent-adolescent discussions about sexuality and contraceptive use are also associated with adolescent sexual behaviors. Researchers studying small cross-sections of minority teens have found an association between parent-child discussions of condoms and more frequent and consistent condom use by adolescents (Miller, Levin, Whitaker, & Xu, 1998;

Romer et al., 1999). Using national data, Manlove et al. (2000) found that girls who discussed with their parents how pregnancy occurs had a lower likelihood of teen birth than girls who did not talk with their parents about this topic. Holtzman and Rubinson's (1995) examination of never-married teens aged 13-19 showed that students who discussed HIV with their parents were less likely to report multiple sex partners or to have unprotected intercourse. In contrast, students who discussed HIV with their peers were more likely to have multiple sex partners. Holtzman and Rubinson also found differences by gender; females were more affected by discussions with parents while males were more affected by discussions with peers. Finally, using a sample of black and Hispanic adolescents in grades 9 to 11, Whitaker and Miller (2000) found that parent-adolescent discussions about sex and condoms are associated with adolescents displaying less conformity to perceived peer norms and behaviors regarding sexual activity and condom use. Furthermore, teens who talked with their parents about sex were more likely to believe that parents, rather than peers, provide the most useful information about sex.

While the majority of studies found beneficial effects of parent-adolescent communication about sexual issues, Widmer (1997) produced a contrary report. A cross-sectional analysis of 183 pairs of siblings in Philadelphia found that, after controlling for background characteristics and sibling effects, teens who talked with their parents about sexual topics such as the biological effects of sexual activity, using and obtaining birth control, how to avoid STDs and how to use a condom were *more* likely to have experienced first intercourse than teens who did not discuss these topics with their parents. However, this analysis cannot isolate causal ordering.

Monitoring

Several studies show that parents who monitor their adolescent children's behaviors can help prevent early sexual debut (Miller, 1998; Hogan & Kitagawa, 1985). A study of African Americans aged 9 to 17 who were living in urban public housing found that high levels of parental monitoring were associated with a lower likelihood of very early sexual debut (age 10 or earlier), as well as reduced rates of sexual initiation at later ages (Romer et al., 1999). Smith (1997) also examined a sample of urban minority youth and found, among males but not females, the perception of being strongly supervised was associated with a lower likelihood of having an early sexual debut.

In a study of minority adolescents aged 14-16 from Alabama, New York City, and San Juan, Puerto Rico, Miller, Forehand, et al. (1999) found that higher levels of parental monitoring are associated with fewer sexual partners among males and females as well as a greater likelihood of condom use among sexually active teens. In a bivariate study of predominately white females from a Midwestern state, Luster and Small (1997) found that teenagers whose parents closely monitored their activities had fewer sexual partners than teens whose parents did not monitor their activities.

Higher levels of parent involvement in school among school-age teens were associated with a lower likelihood of a birth even after controlling for grades and test scores (Manlove, 1998). In addition, parents' expectation that their son would go to college was associated with a reduced likelihood that urban male teenagers would become fathers (Thornberry et al., 1997).

Parent Attitudes About Sex

Parent attitudes, as well as adolescent perceptions of parental attitudes about adolescent sexual activity, contraceptive use, and childbearing are associated with teen reproductive health behaviors.

For example, several national studies show that perceived parental disapproval of sexual activity is associated with reduced risk of adolescent sexual activity (Bearmann & Brückner, 2001; Blum, Beuhring & Rinehart, 2000; Halpern et al., 2000; Resnick et al., 1997), and, in bivariate analyses, with having fewer sexual partners among those female teens who are sexually experienced (Luster & Small, 1997). Adolescents who report parental pressure not to have sex also have a reduced likelihood of sexual experience (Widmer, 1997).

Perception of parental approval or disapproval of contraception is also associated with teenagers' sexual outcomes. Adolescents who believed their parents would disapprove of adolescents using contraception were much less likely to have a history of pregnancy than adolescents who perceived parental approval of contraceptive use (Resnick et al., 1997). In addition, teens whose parents report that it is too easy for teens to get birth control were less likely to have initiated sexual intercourse than teens who parents reported that it was not too easy for teens to get birth control (Widmer, 1997).

Summary: Family Factors

The literature provides a strong consensus that family factors are powerfully related to the reproductive health of adolescents. In general, higher socioeconomic status, family stability, close parent-child relationships, and parent-child communication about sexual issues positively influence adolescent reproductive behaviors. Higher family income is associated with later age at first sex and a lower likelihood of teenage births. Furthermore, studies suggest a beneficial relationship between high parent education levels and positive sexual behaviors (less frequent sex, greater contraceptive use, fewer teenage births).

From a family structure standpoint, experiencing family turbulence (compared to living in an intact family) influences adolescent reproductive health in a negative fashion. Teens from non-intact families tend to have an earlier initiation into sex, a lower likelihood of using contraception, and a higher risk of giving birth. Furthermore, teenage sexual experiences seem to follow an inter-generational transmission pattern. If an adolescent's mother had a teenage birth, the adolescent herself is more likely to initiate sex at an early age and to become a teen mother. Similarly, if a teen has a sexually experienced sibling or a sibling who is a teen mother, the adolescent is more likely to be at risk.

The quality of parent-child relationships has a vital association with teenage reproductive health. When teens feel that they have close emotional bonds and satisfying relationships with their parents, they are less likely to engage in sex, more likely to use contraception, and less likely to get pregnant. In addition, if parents talk to their children about sex, contraception and STIs, the teens display a higher likelihood of making careful choices about their sexual behaviors. Such parent-child communication seems to be especially effective when parents express their disapproval of teenage sexual activity.

Peers

Research on peer and friendship influences on adolescent reproductive health includes studies of teen perceptions of peer attitudes and behaviors as well as peer reports of behaviors. These studies show influences of peer sexual activity, substance use, educational aspirations, and peer and friendship networks on sexual behaviors among adolescents, with higher risk peers predicting earlier sex and poorer contraceptive use.

Perceptions vs. Behaviors

A longitudinal study of male and female adolescent participants in an urban, STI and pregnancy intervention program found that teens who reported having friends who favor postponing the initiation of sexual intercourse were more likely themselves to delay the onset of sexual intercourse (Carvajal et al., 1999). Similarly, earlier perceived peer sexual debut was associated with an increased likelihood of having had sex and younger age of sexual initiation in a sample of black and Hispanic teens in Alabama, New York City, and San Juan, Puerto Rico from the 1990s (Whitaker & Miller, 2000).

Adolescents who believe that their peers do not use condoms or that peers do not like using condoms are less likely to use condoms (in bivariate analyses) (Whitaker & Miller, 2000), while adolescents who believe that their peers practice or support condom use during sexual intercourse are less likely to be sexually experienced and are more likely to report higher levels of condom use (Boyer et al., 1999, DiClemente et al., 1996). Adolescents' perceptions about their peers' sexual activity norms for condoms are related to teen sexual behavior more strongly among teens who have not talked to a parent about initiating sex or about condoms than among teens who have (Whitaker & Miller, 2000).

Peer Sexual Activity

The perception that peers are sexually active increases with age (Alexander & Hickner, 1997). Adolescents who report believing that most of their peers have had sex are more than twice as likely to report having a high intention to initiate sexual intercourse in the coming year (Kinsman et al., 1998). Believing that peers endorse and engage in sexual intercourse was associated with an increased incidence of teen sexual intercourse for male and female adolescents receiving health care at private family practices in Michigan (Alexander & Hickner, 1997). Sexually experienced adolescents under the age of 15 were more likely to report that their peers were also sexually experienced compared to sexually inexperienced adolescents of the same age in samples of male and female African American adolescents in Philadelphia (Jaccard, Dittus & Litardo, 1999) and male and female, white, black, Hispanic, and Asian sixth-grade students in 14 public schools in Philadelphia in 1994 (Kinsman et al., 1998).

In a longitudinal study of middle school students in an urban area of Northern California, adolescents who reported having a greater number of friends who endorse having early sexual intercourse were more likely to have had sex (Marin et al., 2000). Similarly, having a best friend who is sexually experienced increases the likelihood of sexual experience among adolescent females (Lock & Vincent, 1995), and having sexually experienced friends is associated with a younger age at first intercourse among males (Miller, Norton, et al., 1997). Teens who are more likely to be sexually experienced and who report a greater number of sexual partners are also more likely to have a greater percentage of sexually active friends (Whitaker & Miller, 2000).

Peer Substance Use

Having peers who use substances or thinking that peers use substances are sexual risk factors for adolescents. Drinking alcohol, using marijuana, and having peers who drink and have substance use problems are all strongly associated with sexual experience among both males and females aged 14-18 who are the oldest children of young mothers in a national survey (the NLSY 1979) (Kowaleski-Jones & Mott, 1998). Black adolescent females who participated in the in-home interviews of the first wave of the Add Health survey in 1995-1996 and reported having a large number of friends who drink are also more likely to have had sexual intercourse (Blum, Beuhring & Rinehart, 2000). Similarly, a longitudinal study shows that having more friends who engage in problem behavior and problem drinking is associated with an increased risk of sexual initiation for Hispanic adolescents (Costa et al., 1995). Drinking alcohol and spending time with friends who drink are independently linked with nonuse of birth control among sexually experienced females (Kowaleski-Jones & Mott, 1998). A survey of sixth grade students in public schools in Philadelphia found that sixth graders who perceived that older adolescents used alcohol were more likely to have had sexual intercourse (Kinsman et al., 1998). Adolescents who have initiated sexual activity are more likely than their sexually inexperienced peers to report that "most kids they know" start using alcohol and cigarettes at 13 or 14 years old (Kinsman et al., 1998).

Peer Educational Aspirations

Recent research indicates that low-risk peers (peers who are more engaged in school and less engaged in delinquent behavior) have a protective influence on sexual debut and adolescent pregnancy for adolescent girls in a nationally representative sample (Bearman & Brückner, 1999). Low-risk male and female best friends of adolescent girls protect against sexual debut, while high-risk male and female best friends increase the risk of sexual initiation for adolescent girls (Bearman & Brückner, 1999). This study suggests that for adolescent girls, the risk status of her female friends is a more important protective factor in determining adolescent pregnancy risk than is her own individual risk status—adolescent girls with low-risk female friends are at a lower risk for pregnancy while adolescent girls with high-risk male friends are at an increased risk for pregnancy (Bearman & Brückner, 1999).

Having a high proportion of achieving friends (friends who think or hope they will go far in school) in adolescence reduced the risk of being involved in adolescent pregnancy in a sample of adolescents in 150 public high schools in two upstate New York counties from the 1980s and early 1990s (Kasen, Cohen, & Brook, 1998). Sexually inexperienced adolescents were more likely to have high-achieving peers (peers enrolled in higher levels of mathematics courses), and having higher achieving peers predicted subsequent timing of age at first voluntary sexual intercourse for white boys but not white girls in a longitudinal study of youth in Michigan from the 1980s and early 1990s (Meschke et al., 2000). Similarly, among white adolescents in a longitudinal study of middle and high school students in a large, metropolitan school district in the western United States, having relatively more friends who engage in problem behaviors was associated with an earlier age of sexual initiation (Costa et al., 1995)

Relationship with Peers

One national-level study of school-age teens suggests that risk characteristics of an adolescent girl's close friends and larger peer group have a greater influence on her sexual debut than the characteristics of her best friend (Bearman & Brückner, 1999). Adolescents who have

strong peer affiliations are more likely to be sexually experienced and are at a greater risk for STIs (Boyer et al., 1999), while teens who are not part of a peer group are less likely to have experienced sexual debut (Bearman & Brückner, 1999). Alternatively, longitudinal data show that girls who are more popular, "in the leading crowd" in their schools, and who have older friends are more likely to have experienced sexual debut than other girls (Bearman & Brückner, 1999). Similarly, placing more importance on popularity is associated with an earlier age at first voluntary sexual intercourse among both males and females (Meschke et al., 2000). In addition, a longitudinal study in seven western states shows that adolescents who reported high levels of bonding (with family, friends, school and community) were less likely to have had sexual intercourse in the past month (McBride et al., 1995).

Summary: Peers

Adolescents appear to respond strongly to peer influences on their reproductive health behaviors. Teens with sexually active friends are more likely to have sex themselves and to have had multiple partners. In contrast, adolescents whose friends favor delayed initiation tend to delay sexual debut themselves. Not only are actual peer behaviors important, but even the perception of peer behaviors is also influential. Teens experience earlier sexual initiation if they believe their peers are having sex. Adolescents who perceive that their peers dislike or avoid condom use are less likely to use condoms themselves. Actual or perceived substance use by friends is also linked to earlier age of sexual initiation and lack of contraceptive use.

The characteristics of one's peers are important as well. Having older friends is related to increased risk of sexual activity. Teens report less sexual activity and lower risk of pregnancy if their friends have high educational aspirations. Finally, the benefits of positive parent-child relationships are not limited to one's own individual experience. Teens report healthier, more responsible reproductive behaviors if they have friends who enjoy close relationships with their own parents.

Partners

Characteristics of teens' sexual partners are associated with their reproductive health behaviors. The following section provides an overview of the association between sexual partners (i.e., the relationship context, the number of sexual partners, and partner characteristics) and reproductive health.

Relationship with Partner

Not surprisingly, as the number of romantic relationships increased, the likelihood of having first sexual intercourse also increases (Bearman & Brückner, 1999). Specifically, national cross-sectional analyses show that school-age teens who have had a romantic relationship in the past 18 months were more likely to have had intercourse (Blum, Beuhring, & Rinehart, 2000; Halpern et al., 2000). Additionally, males and Hispanic females who had ever kissed or "necked" were more likely to have sex than respondents who had not ever kissed or necked (Blum, Beuhring, & Rinehart, 2000). Among black females aged 12-19, intending to go steady with the first or next partner increased the likelihood of having a sexual experience (Lock & Vincent, 1995).

There have been some conflicting findings on the influence of relationships with sexual partners on contraceptive practices among women and men. In a study of factors associated with

contraceptive use at first sex, Manning et al., (2000) found that adolescent women who just met their partners at the time of first sex were less likely to use a contraceptive method than those who were already going steady when they first had sex. Men are more likely to use methods for STD prevention in casual relationships than in more serious, committed relationships (Forste and Morgan, 1998). In preliminary analyses of a small-scale study, Sugland (1999) also found that adolescents who report casual or "non-romantic" sexual partners were more likely to exhibit risky sexual behaviors, including a reduced likelihood of contraceptive use. However, a study of condom use among adolescent and young adult males (ages 17-22) found that the length of the relationship was not associated with condom use at first sex (Ku, Sonenstein, & Pleck, 1994). This finding may reflect a different orientation to relationship context among males and females or a difference in measurement. This study did find that males were more likely to report condom use at first sex with a partner they perceived to be a virgin.

In addition, among a sample of black and Hispanic public high school students from Alabama, New York, and Puerto Rico, Whitaker, Miller, May, and Levin (1999) found that teenagers who communicated with their partners about sexual risk were significantly more likely to use condoms over their lifetime than teens who did not communicate with their sexual partners about sexual risk. Finally, a male was also more likely to protect himself against STDs if he believed he had at least an equal or greater responsibility than the woman for contraception. If a man believed the woman was primarily responsible for contraception, he was less likely to actively try to prevent STDs (Forste and Morgan, 1998).

Marriage

Married adolescents have higher pregnancy and birth rates and lower abortion rates than unmarried adolescents (Darroch, Landry, & Oslak, 1999b). For example, national estimates show that among females less than 18 years old in 1994, the pregnancy rate was 753.4 per 1,000 married females compared to 79.6 for unmarried females (Darroch, et al., 1999b). In part, this reflects a diminished but continual tendency for pregnant teens to marry. Not surprisingly, marriage also affects sexual activity. Among teens who were currently sexually active, married females were less likely than their unmarried counterparts to have had multiple sexual partners in the three months preceding the interview (Santelli et al., 1998). Findings are similar among males (Santelli, et al., 1998). Unmarried women are at greater risk for STDs than married or cohabiting counterparts because of their increased likelihood of exposure to multiple sex partners (Finer et al. 1999).

Number of Sexual Partners

Black and white women with more than five lifetime sexual partners are more likely to report a bacterial STD and to have been treated for PID than women with only one lifetime sexual partner (Miller, Cain, et al., 1999). In addition, women who had more than one partner in the past year were more likely to report having used condoms for STD prevention than women who had fewer partners (Finer et al., 1999). In a study of condom use among inner-city women, Santelli et al., (1996) found that women who reported more than one partner are more likely to use a condom in their "other" relationship than in their main or regular relationship. This finding suggests that contraceptive use may differ with primary and secondary partners. In addition, recent studies of condom use among males and inner-city females suggest lower levels of condom use in cohabiting relationships or in relationships that eventually resulted in cohabitation

or marriage (Ku et al., 1994; Santelli et al., 1996). However, studies do not indicate whether their female partners used another contraceptive method at first sex.

Teens who report more sexual partners are more likely to be black (males and females) and Hispanic (males), more likely to have used drugs and alcohol and had early intercourse. Black males and females and Hispanic males were more likely to report having multiple sexual partners than white males; however, Hispanic females had a reduced risk of having multiple sexual partners when compared to white females (Santelli et al., 1998). Drug use and alcohol use increased the likelihood that an adolescent female or an adolescent male had multiple sexual partners (Santelli et al., 1998).

Partner Characteristics

Most of the literature on partner characteristics provides information on the age of the sexual partner, and in many cases, the male partner is older than the female partner (Darroch, Landry, & Oslak, 1999a). The likelihood of a pregnancy occurring during an adolescent females' first sexual relationship increases as the male partner's age increases (Zavodny, 2001). Furthermore, Landry and Forrest (1995) found that fathers were older than mothers, particularly among teenage parents. Darroch et al. (1999a) found that teenagers were more likely than older women to have a partner within two years of their age; however, teenagers were also more likely than older woman to report having a partner three to five years older. Having a sexual partner seven or more years older is associated with reduced odds of using contraception at first intercourse (Abma, Driscoll, & Moore, 1998). Sexually experienced female adolescents with older partners were more likely to become pregnant than female adolescents who reported having partners close in age (Darroch, et al., 1999a). On the other hand, adolescent females who were older than their first sexual partner were more likely to become pregnant while in that relationship than females who were about the same age as their first sexual partner (Zovodny, 2001).

Interestingly, adolescent females who had been going steady or who were engaged prior to their first sexual experience were less likely to have a sexual partner six or more years older than adolescent females who had just met, had been friends, or had been dating their partner (Darroch, 1999a). National estimates show that adolescent females who are the same religion as their first sexual partner have a reduced risk of a nonmarital pregnancy during their first sexual relationship than those who are not (Zovodny, 2001).

Non-Voluntary Sexual Experiences

Non-voluntary sexual experiences include forced intercourse, unwanted sexual contact or abuse, and unwanted but voluntary sexual intercourse. Oftentimes, intercourse is non-voluntary particularly among younger teens (Abma, Driscoll & Moore, 1998). Moore, Nord, and Peterson (1989) found that 7 percent of females and males between 18 and 22 had experienced forced intercourse, and about half of all females' non-voluntary intercourse had occurred prior to age 14. Erickson and Rapkin (1991) studied a sample of Los Angeles middle school and high school youth. Eighteen percent of the females in their sample reported having had an unwanted sexual experience. Most of these sexual experiences occurred prior to the age of 16 – 39 percent occurred prior to age 13 and half occurred between the ages of 13 and 16. Having a history of sexual abuse is associated with an increased risk of sexual coercion during junior high and high school (Small & Kearns, 1993). Non-voluntary intercourse may increase the risk of an adolescent pregnancy (Boyer & Fine, 1992; Laumann, Smith, Besharov, Gardiner, & Hoff, 1996;

Roosa et al., 1997; Stock, et al., 1997), early first intercourse, multiple partners, and failure to use contraception (Stock, et al, 1997). Valois et al. (1999) found that having experienced date rape or dating violence was associated with an increased number of sexual partners among white female students and less so among white male, black female and black male students in grades nine through twelve.

About one-quarter of the young women who reported that their first intercourse was voluntary nevertheless gave a low rating for the wantedness of their first intercourse (Abma, et al., 1998). Young black women were most likely to give a low rating for the wantedness of their first intercourse, while young Hispanic women were most likely to give a high rating (Abma et al., 1998).

Summary: Partners

The current research presents some solid evidence of associations between partner characteristics and reproductive behaviors, although more research is needed to understand the mechanisms driving these associations. The type of relationship adolescents have with their sexual partners is associated with the timing of sexual intercourse, using contraception, and pregnancy. Adolescents with substantially older partners are less likely to use contraception and are more likely to become pregnant. Sharing the same religion as one's partner also provides some protection against nonmarital pregnancy.

Teens who define their relationships as romantic or steady relationships are more likely to have intercourse and to use contraception at first sex than those who view their partnership as casual or who have just met their partner. Not surprisingly, married adolescents are more likely to be pregnant than unmarried adolescents and less likely to have multiple sexual partners.

Teens who typically participate in risky behaviors such as drug and alcohol use also display an increased tendency to take sexual risks by having multiple sexual partners. The greater use of condoms by teens with multiple partners perhaps reflects their awareness of the risks inherent in non-monogamous relationships. Lastly, having experienced non-voluntary sexual intercourse appears to be associated with early sexual intercourse, increased risk of pregnancy, multiple sexual partners, and failure or inability to use contraception.

School Context

While there are clear connections between teen pregnancy and risk behavior, Kasen et al. (1998) have shown that factors such as having a high proportion of achieving friends, attending a school that has a more learning-focused setting, high IQ, and high socioeconomic status protect adolescents from teen pregnancy. The type of school that teens attend, characteristics of the students attending the school, student and teacher perceptions of school safety and crime, and sex education classes are also associated with reproductive health outcomes.

School Type

The type of school that teens attend is associated with adolescent sexual behavior, pregnancy, and childbearing. For example, Resnick, et al. (1997) found that both male and female students in grades seven through twelve who attended parochial (defined as either Catholic diocesan, Catholic parish, Catholic religious order, or other private, religious

affiliation) schools were more likely to delay first intercourse than teens attending non-parochial schools. In addition, Manlove (1998) found that eighth grade females who attended a Catholic or other independent school were less likely to have a school-age pregnancy than students who attended public schools. Among both males and females, attending a private school is associated with a reduced risk of becoming a teen parent (Zill, Nord, & Loomis, 1995).

School Population

The characteristics of the student body of a teen's school are also associated with adolescent reproductive health. A recent study shows that attending a school with a low percentage of economically disadvantaged teens receiving free school lunches is associated with reduced likelihood of a school-age pregnancy among non-Hispanic white teens, even after controlling for individual family socioeconomic status (Manlove, 1998). No association was found among non-Hispanic black or Hispanic students. The minority composition of a school's population is also associated with school-age pregnancy and parenthood. Attending a school with a higher minority population is associated with a greater risk of a school-age pregnancy among non-Hispanic white females (Manlove, 1998) and with a greater risk of teen parenthood among males and females (Zill, et al, 1995).

School Crime

Adolescent perceptions of crime in their schools are associated with the likelihood of school-age pregnancy. Among a sample of "at-risk," students in grades 7-12 in Minnesota, Chandy, Harris, Blum, and Resnick (1994) found that females who perceive widespread vandalism at their school were more likely to become pregnant than female students who did not. Within a national sample, Moore et al. (1998) found that non-Hispanic white students who reported a high level of school crime were at a higher risk for a non-marital school-age birth than students who did not report a high level of school crime. Additionally, Moore, et al. (1998) also found that black females had a reduced risk of a non-marital school-age birth when teachers rated the school as safe.

Sex Education

Schools offer a variety of sex education programs for teens, which may include education about contraceptive methods, sexually transmitted diseases, and abstinence education. Kirby et al., (1994) found that sex education in school delayed the onset of sexual intercourse, reduced the number of sexual partners, and increased contraception use.

More recent studies also suggest that sex education attendance is associated with sexual activity, attitudes, contraception and childbearing. Ku et al. (1998) examined the effect of sex education in school on recent sexual activity among metropolitan males ages 17 – 19. Adolescent males who had received some education on AIDS or STIs were less likely to have had sex in the four weeks preceding the interview than males who did not receive such education. Ku et al. (1998) also found that birth control education was associated with less support for marriage as a response to a non-marital pregnancy while STI education was associated with greater support.

Sexually experienced female teens aged 18 and younger at first sex who reported having birth control education prior to first sex were more likely to use contraception at first sex than females who did not receive birth control education (Manning et al., 2000). On the other hand, weekly sex education attendance in the eighth grade among black female students was associated with an increased risk of a school-age pregnancy (Manlove, 1998) and a nonmarital school-age

birth (Moore et al., 1998). However, the content of these sex education classes were unknown; in addition, it is not known whether high-risk adolescents or schools were more likely to select sex education.

School Based Health Centers

School based clinics are health centers located within schools or on school grounds. These clinics provide a variety of services to students including primary health care and reproductive health services. Providing contraceptives at school-based clinics is not associated with an earlier onset of sexual intercourse nor does it increase the frequency of sexual intercourse (Kisker, Brown, & Hill, 1994). However, clinics in schools have not been found to reduce the birth rate either (Kirby et al., 1993).

Summary: School Context

Multiple aspects of school context are associated with sexual behaviors, pregnancy, and childbearing. Private or Catholic school attendance is associated with a delayed onset of sexual intercourse and a reduced likelihood of a school-age pregnancy or becoming a teen parent. Teens' perceptions of school climate are important. Students who report higher crime levels or vandalism in their school have an increased risk of pregnancy and childbearing compared to students who perceive that their schools are safer.

The demographic composition of the school also influences adolescent behaviors. Some research suggests that attending schools with a low percentage of disadvantaged teens is associated with a reduced risk of pregnancy and childbearing, while attending school with a high minority population may be associated with a greater risk of pregnancy and parenthood. These relationships appear to be especially strong for non-Hispanic white teens.

Finally, the effects of school curriculum should be acknowledged. Sex education programs are not associated with increased sexual activity levels among teens and may, in fact, delay the onset of sexual intercourse, reduce the number of sexual partners, and increase contraception use. However, the bulk of research on sex education suggests that, while teens who attend sex education classes develop an increased knowledge about sexual activity and contraception, such classes have a weak effect on actual contraceptive behaviors.

Neighborhood and Community

Recent research has examined the relationship between the community of residence and reproductive health behaviors. These studies have shown a relationship between measures of neighborhood and community socioeconomic status (SES), racial/ethnic composition, and crime on teen sexual behaviors. However, most studies indicate that individual and family characteristics have a greater impact on reproductive health behaviors than neighborhood and community characteristics.

Community SES

Several recent studies found that teens living in neighborhoods with concentrated poverty and racial segregation have higher rates of non-marital and teenage childbearing than teens who live in communities with higher SES levels (Brewster, 1994a; Brewster, Billy, & Grady, 1993;

Hogan & Kitagawa, 1985). Papillo (2000) found that a higher median household income in the community was associated with a reduced risk of a birth throughout adolescence. Additionally, Sucoff and Upchurch (1998) found that black female adolescents living in under-class (low SES) and working-class black neighborhoods were more likely to have a birth than black female adolescents living in working-class racially mixed neighborhoods, after controlling for family background characteristics.

Community Race/Ethnicity

Teens living in communities with a greater proportion of racial and ethnic minorities may encounter social norms that are more supportive of early sexual behavior and teen childbearing. Researchers have found effects of community racial/ethnic composition on reproductive health outcomes among males and females. Using national-level data from 1988, Ku, Sonenstein, and Pleck (1993) found that teenage males (black and white) living in a community with a higher Hispanic population had fewer sexual partners and less frequent intercourse. However, when individual characteristics are accounted for, the association with the frequency of intercourse dissipated. Additionally, using national data from the 1980s, Brewster, et al. (1993) and Billy, Brewster, and Grady (1994) found that non-black adolescent females living in communities with a higher proportion of foreign-born residents or a higher percentage of black residents were less likely to have non-marital first intercourse. The authors suggest that this finding may be due to a reduced pool of available acceptable sexual partners for white teens living in communities with a high proportion of black or foreign-born residents. As the Hispanic proportion of the community increased, Papillo (2000) also found a reduced risk of a teen birth among non-Hispanic white adolescent females. Furthermore, sexually active teens living in neighborhoods with high proportions of Hispanics were also less likely to use effective contraception than teens who lived in other neighborhoods (Ku et al., 1993).

Neighborhood Crime

High levels of community crime may reflect a breakdown of social norms that, in turn, may be associated with teenage reproductive health behaviors. Urban teens, who grew up in more violent environments, may be more likely to engage in high-risk sexual behaviors, thus affecting teen childbearing. Billy et al. (1994) found among a national sample of non-black females aged 15-19 that as crime rates increased the likelihood of having premarital sex also increased. Other research on school crime suggests that higher levels of perceived crime in school is associated with a greater likelihood of adolescent fertility (Chandy et al., 1994; Moore et al., 1998).

Summary: Neighborhood and Community

Although individual and family characteristics have the strongest impact on adolescent non-marital and reproductive health, neighborhood context does play an important role as well. The demographic and socioeconomic compositions of neighborhoods differentially influence teen sexual behaviors. Teens living in neighborhoods with lower socioeconomic status have higher rates of teenage childbearing. Teens who live in communities with large Hispanic or foreign-born populations are more likely to delay the transition to first intercourse, to have fewer sex partners, and to become a teen parent. However, they appear to be less likely to use effective contraception.

Neighborhood climate also has important influences. In neighborhoods with higher crime rates, adolescents are more likely to engage in risky sexual behaviors. Perceptions of crime have measurable impacts as well. In schools that are perceived to have higher levels of school crime, adolescent fertility rates are higher.

Societal/Policy

Welfare Policies

One primary goal of the 1996 federal welfare reform law was to reduce nonmarital and teenage childbearing. Welfare waivers that were approved before 1996 provide an early source of information to test the association between welfare restrictions and teen fertility, and some recent studies show a negative relationship between welfare waivers and nonmarital fertility (Manlove et al., 2001, Horvath-Rose & Peters, 2001). Multiple studies on the effects of welfare benefits on nonmarital fertility conclude that higher benefit levels are associated with a reduced likelihood of marriage and a greater risk of sexual activity and nonmarital fertility (Afxentiou & Hawley, 1997; Hudson & Moffitt, 1997). However, these effects often differ in size and differ by subgroup, with stronger findings among white women than among black women, among women in their early twenties than among teens, and among lower-income women than among more affluent women and in recent studies than in studies in the 1970s (Rosenzweig, 1999, Hoffman & Foster, 1999, Hudson & Moffitt, 1997).

Welfare demonstration programs aimed specifically at teenage mothers have shown minimal effects on subsequent fertility behavior. New Chance, a welfare demonstration project designed to assist young mothers in strengthening their skills to become self-sufficient, was conducted at 16 sites in 10 states. The program offered participants educational preparation, career training, health and family planning classes and other services such as childcare. A short-term follow-up at 18 months showed the program group to have more pregnancies and abortions and a greater likelihood of living with a husband or partner than the control group. A longer-term follow-up (42 months) showed virtually no difference between these groups on marriage or fertility outcomes (Quint, Bos & Polit, 1997). Another program targeted at transitioning teenage mothers to self-sufficiency, the Teenage Parent Demonstration (TPD), showed no impacts on marriage and fertility behavior. TPD, implemented in New Jersey and Illinois, provided young mothers receiving Aid to Families with Dependent Children (AFDC) supportive services such as case management, child care assistance, and transportation assistance while they were participating in mandatory education, job training, or employment-related activities. Nevertheless, TPD participation did not significantly reduce participants' future pregnancies or births (Kisker, Rangarajan, & Boller, 1998).

Some studies suggest that community-level priorities and funding for contraception, sex education, and pregnancy prevention are associated with improved contraceptive use and a reduced risk of teen childbearing (Argys, Averett & Rees, 1998). In addition, programs targeted at improving HIV awareness may also be associated with improved contraceptive use and reductions in teen childbearing (Manlove, Terry, Gitelson, Papillo & Russell, 2000).

Early Childhood Programs

Two early childhood programs targeted to low-income African American children, the Hope/Scope Perry Preschool Project and the Carolina Abecedarian Project, showed a significant impact of quality preschool or day care programs on childbearing experiences years later.

The High/Scope Perry Preschool Project was conducted in Ypsilanti, Michigan starting in the late 1960s and included a sample of 123 economically disadvantaged African-American children who were divided into two samples at ages 3 or 4. The experimental group was placed in a high-quality preschool that encouraged active learning among children (High/Scope Educational Research Foundation, 2000). Teachers encouraged children's experiences in the areas of initiative, social relations, creative representation, music and movement, language and literacy, and logic and mathematics. The program also included weekly home visits by teachers in order to discuss and practice activities for parents to carry out with their children. Teachers received curriculum training and supervision, and only five or six students were assigned to each teacher (Schweinhart, Barnes & Weikart, 1993).

At the latest assessment, at age 27, fifty-seven percent of preschool participants had out-of-wedlock births, compared to 83 percent of controls (Schweinhart, Barnes & Weikart, 1993). Thus, participation in a high-quality preschool program that included a great deal of contact between the home and school produced significant, long-lasting results.

The goal of the Carolina Abecedarian Project was to give high-risk children educational experiences early in life so that they could achieve school success. Beginning at age 3 months, a sample of 111 economically disadvantaged African-American children was randomly assigned to receive either high-quality childcare or no treatment. Children in the treatment group received childcare for 6 to 8 hours per day, 5 days per week through kindergarten entry at age 5 (Horacek, Ramey, Campbell, Hoffman, & Fletcher, 1987).

The caregiver-to-infant ratio in the childcare center was 1:3 initially, and increased to 1:6 as children got older (Campbell & Ramey, 1995). The activities that teachers carried out targeted four areas: cognitive and fine motor skills, social and self-help skills, language, and gross motor skills. Activities were individualized for infants and children based on readiness. As the children reached age 3 or 4, the center became a preschool program with centers for a variety of activities. Long-term follow-ups show a delayed age at childbearing among children who participated in the preschool program (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, Forthcoming). Among those who had a child by age 21, participants in the preschool program were, on average, 1.4 years older than those in the control group (19.1 years compared with 17.7 years in the control group) and were less likely to have had a teenage birth.

Both programs also showed associations with more positive educational outcomes among program participants. These studies show the potential of early childhood programs to influence fertility outcomes, as well as educational outcomes.

Community Volunteer Service Learning Programs

Community volunteering programs that also include classroom time to prepare and reflect on that service were associated with reduced sexual activity and pregnancy. Two programs show positive reproductive health outcomes of reduced sexual activity or pregnancy during the time the adolescent participated in the service learning program.

The Teen Outreach Program is a national, volunteer service program that includes supervised community volunteer services, classroom discussions related to the service experiences, and other classroom discussions and activities (Allen, Philliber, Herrling &

Kuperminc, 1997). Participants in the program spent an average of 46 hours volunteering during the 9-month program and participated in weekly classroom discussions. Although the program did not emphasize either teen pregnancy or school failure, both were measured outcomes. Participation in the Teen Outreach Program was associated with reduced pregnancy rates among female students and with positive academic outcomes among all participants (Allen et al., 1997).

Students participating in the Reach for Health Community Youth Services Program did 3 hours per week of community service for 30 weeks, accompanied by their teacher. In addition, the students shared their experiences in a classroom setting (Kirby, 2001). 195 low-income students in the 7th grade participated in either receiving the Reach for Health curriculum plus volunteer service or the Reach for Health curriculum only. Results show that students receiving the Reach for Health curriculum plus volunteering were less likely to report initiation of sexual intercourse than members of the curriculum-only group (Kirby, 2001). In addition, participants in the full intervention were less likely to report having had sexual intercourse in the past month than members of the curriculum-only group.

Programs that Combine Youth Development and Sexuality Education

Two multi-component programs that focused on both sexual and non-sexual antecedents of reproductive health behaviors showed significant differences between experimental and control groups. However, a more general youth development program did not have significant impacts on reproductive health outcomes.

A Washington state study evaluated three programs having an experimental design and included 690 teenagers ages 14-17 perceived to be at elevated risks of early sexual activity or pregnancy (McBride & Gienapp, 2000). The three programs included a variety of different services, including sexuality and HIV education, educational sessions, social and recreational activities, mentoring, and/or regular support group sessions focused on reducing adolescent pregnancy. Participants received an average of 27 hours of service in total, and program participants at one site were less likely to report recent sexual activity, more likely to report contraceptive use at last sex and more likely to use contraception always than the control group; however these effects were not found in the other two sites (McBride & Gienapp, 2000). The site that averaged the highest number of hours of participation in the program showed the most significant results. The authors suggest that more intensive programs are required to influence behaviors among high-risk adolescents.

Another more intensive program, the Children's Aid Society-Carrera Program (CAS-Carrera), had a substantial long-term impact on pregnancy (Philliber, Kaye, & Herrling, 2001). Program participants included 941 mostly poor and minority teens ages 13 to 15 at enrollment who were from disadvantaged neighborhoods in 7 urban areas of the U.S. The CAS-Carrera program included five components: (1) a work-related intervention, (2) an educational component; (3) family life and sex education; (4) performing arts involvement; and (5) sports activities. Teens were followed for three years and attended the program an average of 12 hours per month. In addition, adult organizers in the community had contact with teens or their families outside of regular program hours an average of twice a month. Females in the program were more likely to use Depo Provera and were less likely to become pregnant or have a birth three years later. However, among males, the program did not have significant effects on sexual initiation, using a condom, causing a pregnancy or fathering a child (Philliber et al., 2001).

One general youth development program, the Quantum Opportunities Program, was assessed by Kirby (2001). This program included educational activities and community service activities in multiple sites but showed no impact on birth rates, except in the Philadelphia site.

Vocational Education

The four vocational education programs with strong experimental designs-- Conservation and Youth Service Corps, Job Corps, JOBSTART, and Summer Training and Education Program – had no or minimal positive effects on teen pregnancy or birth rates (Kirby, 2001). Only one program (Conservation and Youth Service Corps) demonstrated any positive influence on adolescent sexual behaviors.

The Conservation and Youth Service Corps is comprised of intensive, typically full-time programs that last between six and twelve months (Jastrzab, Blomquist, Masker, & Orr, 1997). Within these programs, participants (usually disadvantaged young people aged 18-25) spend 80% of their time performing community service while simultaneously acquiring work experience and education. Participants work in teams of 8 to 15 members on a variety of service projects in communities nationwide. Corps members follow structured rules designed to foster personal development and responsibility, as well as enhance work skills and decision-making abilities. An important component of Corps programs is the daily presence of crew supervisors; these supervisors serve as adult role models who mentor, advise, discipline, and advocate for participants. Program participants are paid a stipend and may also receive post-program financial aid for education. This program has shown some positive impact on sexual behaviors. Black unmarried women who participated in the program had lower rates of pregnancy at follow-up. Lower pregnancy rates were not observed for Hispanic or non-Hispanic white women.

Job Corps is an intensive education, vocational training, and support program (Schochet, Burghardt, & Glazerman, 2000). Each year, the program serves more than 60,000 disadvantaged youths aged 16 to 24; most participants live together in residential settings. Job Corps centers provide individualized and self-paced academic instruction, occupational skills training, health care, counseling, and activities designed to improve interpersonal skills. The average participation period lasted eight months. One evaluation of the program compared youth randomly assigned to either the Job Corps experimental group or to a control group and found no significant differences in birth rates between groups.

The JOBSTART program ran from 1985 to 1989 in 13 sites (Cave, Bos, Doolittle, & Toussaint, 1993). It targeted high school dropouts aged 17 to 21 with poor reading skills and provided them with basic educational skills, hands-on job training, work placement assistance, and support services. The support services included childcare, counseling, transportation aid, and work- and life-skills training. One key asset of JOBSTART was the length of time invested in participants -- an average of 7 months. The program had positive impacts on participants' earnings, but showed no positive impacts on sexual behaviors.

The STEP (Summer Training and Education Program) program aimed to negate academic losses during the summer months and to promote social and sexual responsibility Walker & Villela-Velez, 1992). The program served disadvantaged 14- and 15-year-olds performing below grade level in school, and teens were randomly assigned to either a treatment or control group. The treatment group received 90 hours of remedial math and reading instruction services along with part-time, paid summer employment. Participants also received life skills training and instruction about contraceptive availability and use. Program members were eligible to participate for two summers, and they also received periodic counseling and

advocacy support during the interim school year. Teens in the control group were only involved in the summer job segment of the program. Comparison of the treatment and control groups showed no significant effects of the program on teens' sexual activity, use of contraception, or births.

Abstinence-only

Only one abstinence-only program has had a rigorous experimental design, and this program did not show an impact on reproductive health outcomes. Postponing Sexual Involvement/ENABL used an experimental design to assess impacts of a classroom program on sexual initiation, the frequency of sexual intercourse, and the number of sexual partners of 7th and 8th graders in California. 7,340 youth were involved in one of three groups in this program: receiving the program in a youth-led setting, an adult-led setting, or not receiving the program (the control group). Participants in PSI received, in addition to any sexuality education that was already in place in their school curriculum, an additional five sessions lasting 45 to 60 minutes which may have included class discussions, group activities, use of videos or slides, as well as role-playing (Kirby, Korpi, Barth & Cagampang, 1997). At the 3-month and 17-month follow-up of this program, there were no differences in the percent of youth who initiated sexual intercourse between those who participated in the program and the control group. Further, among those youth who were sexually experienced, there were no differences in the frequency of sexual intercourse, the number of partners, condom use, or pill use (Kirby et al., 1997). Nevertheless, future research will provide more information on the effectiveness of abstinence-only education programs in the U.S.

Sexuality Education Programs

Eight sexuality education programs have been evaluated with experimental designs. Of these programs, four showed some positive impacts (Draw the Line/Respect the Line; McMaster Teen Program; Postponing Sexual Involvement, Human Sexuality, and Health Screening; and Safer Choices); two showed no impacts on sexual outcomes (Project SNAPP and Blake et al's Michigan evaluated program); one showed mixed impacts (Teen Talk); and one showed negative impacts (Health for Life Project).

Many sexuality education programs included both an abstinence message and messages about the benefits of contraception to protect against STDs and pregnancy, and many programs focused on pregnancy prevention and STD prevention. Although many of these studies found no significant impact on reproductive health outcomes some programs did show some positive impacts for some populations. Note that very few studies measured whether their programs affected pregnancy and/or STD outcomes, and those that did showed no impact.

Draw the Line/Respect the Line was a sexuality education program conducted in California that used 20 sessions over the course of 6th through 8th grade to delay the initiation of sexual activity among adolescents (Kirby, 2001). Adolescents received educational instruction about the consequences of sexual activity and practiced skills to avoid sexual activity and/or unplanned pregnancy. Although there were no significant differences in impacts for females, boys in the experimental program were less likely to initiate sexual intercourse at the end of 7th and 8th grade or to have had sex in the last 12 months at the end of 7th and 8th grade than boys in the control group (Kirby, 2001).

The McMaster Teen Program was a pregnancy prevention program for adolescents in grades 7 and 8 in Hamilton, Ontario, Canada. A randomized controlled trial design was used to evaluate this program. Over the course of a 6 to 8 week period, 10 1-hour small group sessions were held that were designed to help students avoid an unplanned pregnancy by providing them with information on sexuality issues, communication and problem solving skills, and the opportunity to practice avoidance (Thomas, Mitchell, Devlin et al., 1992). Each session was lead by a trained 'tutor' who participated in a 40-hour workshop and received a guidebook. Further, each student participant received a guidebook program. In rigorous models controlling for school effects, there were no impacts on the initiation of first sexual intercourse, consistent use of birth control, or pregnancy (among females).

Junior high students in 6 Washington, DC schools were randomly assigned to an experimental group that received the Postponing Sexual Involvement, Human Sexuality & Health Screening curriculum in the 8th grade or to a control group (Aarons, Jenkins, Raine, et al., 2000). Students in the experimental group attended three classrooms sessions lead by a trained project facilitator and five classroom sessions of the PSI curriculum lead by peer leaders. In addition, students in the experimental group were invited to participate in small round-table discussions on various adolescent health issues and an 8th grade assembly on sexually transmitted diseases (Aarons et al., 2000). Females in the experimental group were more likely to remain virgins at the 6-month follow-up and at the end of the eighth grade than females in the control group. In addition, sexually experienced females in the experimental group were more likely to use birth control at last intercourse than sexually experienced females in the control group. There were no significant findings for males.

Safer Choices was a sexuality education program set in high schools in San Jose, CA and Houston, TX, designed to encourage abstinence as the safest way to avoid pregnancy or STDs and to encourage condom use among sexually experienced students (Kirby, 2001). Students in the experimental group received lessons and participated in skill-based and interactive activities in five components of the program: school health protection council, curriculum, peer resources and school environment, parent education, and school-community linkages (Kirby, 2001). Control group participants received the schools' regular sexuality education curriculum. Results of the experimental evaluation indicated that students who participated in the experimental group were more likely to use condoms and contraception at last intercourse and were less likely to have sexual intercourse without condoms or many sexual partners without condoms than participants in the control group (Kirby, 2001). No impacts were observed for initiation of intercourse, frequency of sex, or number of sexual partners.

Project SNAPP (Skills and kNowledge for AIDS and Pregnancy Prevention), was an AIDS and pregnancy prevention program offered to middle school students in six Los Angeles schools (Kirby, Korpi, Adivi & Weissman, 1997). Adolescents were either assigned to the experimental group that received 8 sessions on adolescent sexual health delivered over the course of 2 weeks or a control group that received the regular sexuality education the school offered. SNAPP sessions were designed to make teens aware of adolescent sexuality issues and help them gain better communication and resistance skills through interactive activities. Peer educators, 50% of whom were teen mothers and 20% who were HIV positive, received extensive training and led these sessions. There were no significant impacts on sexual initiation, frequency of sexual activity, number of sexual partners, contraceptive behavior, STD rates among sexually experienced teens, or pregnancy (among females) at either the 5-month or 17-month follow up.

One sexuality education program took place in several school classrooms in Michigan (Blake et al., 2000). Adolescents aged 14-16 in the experimental program were taught in interactive and skill-based lessons about abstinence and also about condoms while the control group received the regular sexuality education curriculum (Kirby, 2001). Short-term follow-up results showed no significant difference between the experimental group and the control group in participants who were sexually experienced or sexually active (sex in the past 3 months) (Kirby, 2001).

Teen Talk was a sexuality education program given to 13-19 year olds that provided factual information and three different types of group discussions (values, feelings and emotions, and decision-making and personal responsibility) (Eisen, Zellman & McAlister, 1990). Trained staff led adolescents in the experimental group in 8-12 hours of sessions consisting of lectures, simulations, discussions and role-playing (Eisen et al., 1990). The control group received the regularly scheduled sexuality education curriculum. Findings from an experimental evaluation of the program indicate that results were mixed. Males who were virgins at the beginning of the program who participated in the experimental program were more likely to remain virgins in the next year than virgin males in the control group. Further, after controlling for pre-intervention contraceptive efficiency, males who participated in the experimental group were more likely to have greater contraceptive efficiency during the next year than males who were in the control group. There were no significant differences among females in the experimental and control groups in the percentage who remained abstinent or had greater contraceptive efficiency the following year. However, among females who initiated first sexual intercourse after the program started, those in the experimental group were less likely to use an effective contraceptive method at last intercourse and less likely to use effective contraceptive methods in general than those in the control group.

The Healthy for Life Project (HFL) was an intervention program designed to affect five areas of adolescent health, including sexuality (Moberg & Piper, 1998). The goals of the program were for students to remain abstinent, but if sexually experienced, to use effective contraception to avoid pregnancy and sexually transmitted diseases. Middle school students were followed from Grade 6 to Grade 10 and were assigned to one of three conditions: the 'age appropriate' condition where the adolescent received the program divided between grades 6-8; the 'intensive' condition where the adolescent received the entire program in the 7th grade; and the control group which received the currently offered programs within their schools. Sexuality issues were focused on in 16 of 54 core lessons. Within these lessons, students were taught by a trained instructor and peer leaders and were given the opportunity for active learning that focused on behavioral change. Family and community components were designed; however, the evaluation found that they were not implemented as planned (Moberg & Piper, 1998). Program findings indicate that adolescents in the experimental groups were not more likely to use condoms and, contrary to expected findings, were more likely to engage in sexual intercourse at 9th grade and at 10th grade ('age appropriate' condition only). Further, students in the 'age appropriate' condition were more likely to have had intercourse in the past month in 10th grade than adolescents in the control group.

HIV Education Programs

Seven HIV/AIDS education programs have been evaluated with experimental designs. Four programs showed some positive effects (Becoming a Responsible Teen; Be Proud, Be

Responsible; Be Proud! Be Responsible! A Sexual Abstinence Curriculum; and Be Proud! Be Responsible! A Safer Sex Curriculum) while the other three showed no effects on sexual outcomes (Gillmore et al.'s Seattle evaluation, 1997; Slonim-Nevo et al.'s St. Louis evaluation, 1996; and Youth AIDS Prevention Project).

225 African American adolescents between the ages of 14 and 18 largely from low-income households participated in an HIV risk reduction program named 'Becoming a Responsible Teen' (St. Lawrence, Jefferson, Alleyne, Brasfield, O'Bannon & Shirley, 1995). Participants in the experimental group received 8 weekly small-group education and behavioral skills training sessions led by a male and female facilitator that lasted between 90 and 120 minutes. Participants in the control group participated in a 2-hour session that met once. The experimental program included types of activities such as lecture, video, group discussion, role-playing and hands-on activities. Communication and cognitive skills and assertiveness were also taught (St. Lawrence et al., 1995). Teens in the experimental program were less likely to have unprotected sexual intercourse and they completely discontinued unprotected anal intercourse. Male and female participants in the experimental program were more likely to use condoms immediately after the intervention, and females in the experimental group were more likely to use condoms after 1 year of the intervention. Finally, participation in the experimental group of the Becoming a Responsible Teen program showed a reduction in rates of sexual activity among teens that were sexually experienced before the intervention as well as a lower rate of sexual experience among those who were virgins at the start of the program. No impact was observed for number of sexual partners.

Be Proud, Be Responsible was an intervention program that attempted to reduce the risk of HIV infection among a population of African American male teens (Jemmott III, Jemmott & Fong, 1992). 157 black males from Philadelphia, PA participated in the intervention that took place over a 5-hour period on one day. Participants in the experimental group watched videos and participated in games and exercises that informed them of AIDS and STDs and encouraged stronger attitudes toward risky sexual behaviors, while members of the control group participated in a 5-hour session on career planning (Jemmott et al., 1992). Results of an experimental design show that at the 3-month follow-up period, participants of the experimental group had fewer days of sexual intercourse, fewer sexual partners, and a greater use of condoms and a lower incidence of anal intercourse than members of the control group.

'Be Proud! Be Responsible! A Sexual Abstinence Curriculum' and 'Be Proud! Be Responsible! A Safer Sex Curriculum' was a safer sex and HIV-risk intervention program for African American adolescents in 3 low-income area middle schools in Philadelphia, PA (Jemmott III, Jemmott & Fong, 1998). 610 participants were assigned to, and completed, one of three conditions: the abstinence curriculum, the safer sex curriculum, or a control group that had a health promotion curriculum. Each program consisted of 8 1-hour modules divided over 2 consecutive Saturdays (Jemmott III et al., 1998). Participants watched videos and participated in games, brainstorming, experimental exercises and skill-building activities regardless of the group they were assigned to. The abstinence curriculum emphasized abstinence as the best way to prevent pregnancy or risk of STDs but also mentioned condoms; the safer sex curriculum emphasized the importance of using condoms to prevent pregnancy and HIV/STDs while acknowledging that abstinence is the best method of prevention; and the health promotion curriculum (control group) emphasized behaviors associated with health risks pertinent to African Americans (Jemmott III et al., 1998). Results of a randomized control trial show that there were several positive impacts for participants in both experimental groups. Teens who

participated in the abstinence curriculum were less likely to report having sexual intercourse in the 3-month period that followed the intervention than members of the control group. Participants of the safer sex curriculum were more likely to use condoms consistently at the 3-month follow-up, but not at the 6- and 12-month follow-ups. In addition, frequency of condom use was greater at the 3-, 6-, and 12-month follow-up among members of the intervention group than among members of the control group. Finally, among those who were sexually experienced before the intervention began, participants of the safer sex curriculum were less likely to have sexual intercourse in the previous 3 months at the 6- and 12-month follow-up period than members of the other two groups and less likely to have unprotected intercourse at all follow-up periods than members of the control group.

Three intervention groups were used to encourage the use of condoms among a high-risk group of heterosexually active teens aged 14-19 who were in an urban juvenile detention facility or who had been to an urban public health or STD clinic (Gillmore, Morrison, Richey, Balassone, Gutierrez & Farris, 1997 – Seattle evaluation). Teens were divided into one of three intervention groups receiving the following: comic book; videotape; or group skill training (among detention facility participants only). The comic book intervention consisted of 16 pages that provided information and scenarios about STDs including factual information and acknowledgement of myths about STDs and HIV/AIDS. The videotape intervention received both the comic book and a 27-minute videotape that contained messages on STDs as well as enactments by teens on how to develop skills to use condoms. The group skill training consisted of four 2-hour small group sessions conducted over the course of three days. This group skill training section was designed to teach participants four basic skill components, interaction skills with their partners, and consistent condom use (Gillmore et al., 1997). Participants in the group skills training section were also given time to read the comic book and watch the video provided to the other control groups. Trained peer educators and adult facilitators led members of the group skill training intervention in participating in games and activities and role-playing. Participants in the comic book plus videotape intervention were marginally more likely to use condoms with steady partners than were the other interventions. There were no significant impacts on the number of sexual partners for any of the groups.

Slonim-Nevo, Auslander, Ozawa & Jung (1996) examined the effects of an AIDS-preventative intervention among delinquent and abused adolescents (St. Louis evaluation). 218 adolescents from 15 residential centers participated in an experimental study in which they were assigned to one of three groups: skills training, discussion-only, or the control group. There were several similarities to the two experimental groups: each consisted of nine 90- to 120-minute sessions conducted over the course of 3 weeks, both were led by trained facilitators, and the substantive content was identical (Slomin-Nevo et al., 1996). The manner in which each intervention was conducted differed. Whereas participation in the discussion-only group was didactic, participation in the group skills intervention was hands-on, including role-playing, modeling and demonstrations. Follow-up results show no significant impacts on risky sexual behavior (unprotected sex or sex with an unknown partner) among any of the participants regardless of which intervention or control group they participated.

The Youth AIDS Prevention Project (YAPP) targeted adolescents in junior high schools in 15 school districts that were considered to be high risk for HIV infection (Levy, Perhats, Weeks, Handler, Zhu & Flay, 1995). School districts received the YAPP intervention or a delayed treatment/control. Students in control school districts continued to receive the same state-required AIDS education that was already in place. Students in the experimental groups

received ten 1-hour sessions over a two week period in which active learning and skills-building techniques (e.g., role playing, educational competitions and small group exercises) were used to educate and influence students on HIV/AIDS and pregnancy and STD prevention and decision making skills (Levy et al., 1995). Students in the experimental condition were required to do homework (half of the students were required to complete their assignments with their parents). Originally, the experimental groups were divided into two groups with one group having a parent-interaction component. However, because participation was low, the two groups were combined for comparison purposes. Results indicate that among students who became sexually active between the start of the intervention and the follow-up, students in the experimental group did not differ significantly from students in the control group in frequency of sexual intercourse, number of sexual partners, or use of condoms. However, students in the experimental group were more likely to use condoms with foam than students in the control group.

In a synthesis of sexuality education programs that included both experimental and quasi-experimental designs, Kirby (2001) found that those programs that gave a clear message about sexual and contraceptive behavior and that shared ten program characteristics were the most effective:

1) *Focus on reducing one or more sexual behaviors that lead to unintended pregnancy or HIV/STD infection.*
2) *Are based on theoretical approaches that have been demonstrated to influence other health-related behavior and identify specific important sexual antecedents to be targeted.*
3) *Deliver and consistently reinforce a clear message about abstaining from sexual activity and/or using condoms or other forms of contraception. This appears to be one of the most important characteristics that distinguishes effective from ineffective programs.*
4) *Provided basic, accurate information about the risks of teen sexual activity and about ways to avoid intercourse or use methods of protection against pregnancy and STDs.*
5) *Include activities that address social pressures that influence sexual behavior.*
6) *Provide examples of and practice with communication, negotiation, and refusal skills.*
7) *Employ teaching methods designed to involve the participants and have them personalize the information.*
8) *Incorporate behavioral goals, teaching methods, and materials that are appropriate to the age, sexual experience, and culture of the students.*
9) *Last a sufficient length of time (i.e., more than a few hours).*
10) *Select teachers or peer leaders who believe in the program and then provided them with adequate training (Kirby, 2001, p.6).*

Parent-Child Communication Program

Only one study included an experimental design of a program to increase parent-child communication. The Facts and Feelings program (Miller, Norton, Jenson, Lee, Christopherson, & King, 1993) assigned 548 families with a seventh or eighth grader to one of three conditions: receiving a videotape and newsletter designed to encourage discussion between parents and

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children; receiving the videotape only without the newsletter; or being in the control condition where the family did not receive any materials. The videotape included six 15- to 20-minute units on the following topics: changes, values, facts, meanings, choices, and skills. Families that were assigned to the intervention receiving both the video and the newsletter were given materials that helped foster additional discussions. Videotapes were given to the families for a three-month period and then collected. Results showed that although parent-child communication increased during the time that families had the videotapes, there were no significant long-term (9 months) impacts on youths' intentions to have sexual intercourse or their initiation of first sex. However, very few youths in the program initiated first sex during the measurement period, so it was difficult to show any impact.

Clinic-Based Programs

Five clinic-based programs have been evaluated with experimental designs. Two programs showed some positive impacts on reproductive health outcomes (Orr, Langefeld, Katz, & Caine, 1996 (Indianapolis); Danielson, Marcy, Plunkett, Wiest, & Greenlick, 1990 (Portland, OR & Vancouver, WA)). One program showed no impacts (Herceg-Baron, Furstenberg, Shea, & Harris, 1986 (Philadelphia)). Two programs showed both positive and negative impacts (Boekeloo, Schamus, Simmens, Cheng, O'Connor, & D'Angelo, 1999; DeLameter, Wagstaff, & Havens, 2000 (Milwaukee)). Those clinics that showed positive impacts appear to include one-on-one counseling and provide clear messages about appropriate sexual behaviors (Kirby, 2001).

One clinic-based program used behavioral interventions to increase condom use among high-risk girls (Orr, Langefeld, Katz, & Caine, 1996 – Indianapolis evaluation). Using a prospective, randomized, controlled intervention, the study assigned 209 adolescent girls with chlamydia infections to treatment and control groups. The behavioral intervention protocol included one-on-one education about STDs, demonstration of and practice with correct condom usage, and role-playing to promote skills in negotiating condom use with a partner. The control group received standard STD education from a clinic nurse. Statistical analyses controlling for condom use at baseline showed that the behavioral intervention did lead to increased condom use 5 to 7 months later. Despite the intervention, however, consistency of condom use remained low, and, as a result, rates of chlamydia re-infection were not significantly lower in the experimental group.

An experimental program introduced in Portland, OR and Vancouver, WA focused on contraceptive use, sexual health risks, and reproductive goals among 15-18 year old males (Danielson, Marcy, Plunkett, Wiest, & Greenlick, 1990). The experimental treatment consisted of two segments. First, youth watched a slide program that discussed STDs, contraception, the importance of communication with sexual partners, and the availability of health services. Next, each participant met with a health care worker who talked with him about topics such as contraceptive use, abstinence, and sexual health risks. Statistical analyses revealed an increase in contraceptive use among those in the intervention group. This impact was greater for those who initiated sex after entry into the program. The program had no impact on frequency of sexual activity.

One clinic-based program used culturally appropriate, theory-based educational interventions to promote condom use among African American males aged 15-19 (DeLamater Wagstaff, & Havens, 2000 – Milwaukee evaluation). Teens visiting a city STD clinic were randomly assigned to one of three groups – two intervention groups and one control group. Males in the first intervention group individually watched a 14-minute videotape about condom

and STD education. The video was carefully designed specifically for the target group, used familiar language, and showed local settings. The second intervention group received the same messages face-to-face from an African American health educator, and practiced correct condom usage. The control group received the clinic's standard education program. The findings show that adolescent males' knowledge about condom use improved after the intervention, and that the effects were strongest for teens who met face-to-face with the health educator. At the 6-month follow-up, program participants reported more partners and a greater frequency of sexual activity, but there were also more likely to report consistent condom use with steady partners and with casual partners.

A clinic-based program designed to improve effective contraceptive use and reduce pregnancy rates among teens did not produce the desired effects (Herceg-Baron, Furstenberg, Shea, and Harris, 1986 – Philadelphia evaluation). Targeting first-time visitors to family planning clinics, the program randomly assigned 417 girls aged 12-17 to one of two special service groups or one of two control groups. The special service groups were designed to facilitate the teen's adjustment to the new contraceptives and to encourage consistent and continued use. The "family support" special service group offered each girl short-term (6 weekly sessions) family counseling services in an attempt to promote greater family involvement in the teen's contraceptive decisions and practices. Teens in the "periodic support" group also received 2-6 follow-up phone calls from clinic staff in the 4-6 weeks after the initial clinic visit. These calls aimed to monitor the teen's experience with the contraceptives. The two control groups received only the regular clinic services. A 15-month follow-up evaluation revealed no significant impact on contraceptive practices or pregnancy rates.

The ASSESS (Awareness, Skills, Self-efficacy/Self-esteem, and Social Support) program was a randomized intervention trial designed to determine if risk assessment and safe-sex education could reduce sexual intercourse and increase condom use among early adolescents (Boekeloo, Schamus, Simmens, Cheng, O'Connor, and D'Angelo, 1999). Study participants were teens aged 12-15 who visited a primary care physician's office for a general health exam. Teens were asked to participate in the study and, if they agreed, were randomly assigned to either the intervention or control group. Those in the intervention group received comprehensive STD prevention information from their physician that included materials about abstinence as well as condom use. The program aimed to increase awareness of sexual risks and to teach teens skills to help them avoid risky sexual situations. It incorporated face-to-face discussions between the physician and adolescent, as well as written materials about proper condom use, self-efficacy, community resources, and effective parent-child communication. Adolescents in the control group did not receive the educational tools. Statistical analyses revealed that, three months after the intervention, the ASSESS program showed a positive impact on attitudes toward and use of condoms, and on STD knowledge and outcomes. While significant impacts on condom use disappeared by 9 months after the intervention, STD outcomes were still significantly lower among teens in the treatment group. No significant decline in sexual intercourse, frequency of sexual activity, number of sexual partners was observed.

School-Based Health Centers & Condom-Availability Programs

Kirby (2001) identified six quasi-experimental studies that assessed the impact of school-based health centers on the sexual behavior, contraceptive use, pregnancy rates, and birth rates of the school populations. These studies compared outcomes between schools that did and did not have clinics. None of the studies found an increase in sexual behavior as a result of school-

based clinics. Findings were inconsistent for clinic impact on contraceptive use and birth rates, and none of the studies showed a significant impact on pregnancy rates. Kirby concluded that clinics that provided a clear message about both abstinence and contraceptive use and focused primarily on reproductive health had higher contraceptive use rates. However, in absence of experimental design, no concrete conclusions can be made about these types of programs

In addition, an analysis of four condom-availability programs in schools (all of which had quasi-experimental designs), showed inconsistent impacts on condom use – two programs showed increased condom use, one showed no effect, and one was associated with reduced condom use (Kirby, 2001). However, in absence of experimental design, no concrete conclusions can be made about these types of programs.

Community-Wide Initiatives

An analysis of seven community-wide initiatives included multiple types of intervention, all of which were assessed with quasi-experimental designs (Kirby, 2001). In general, community-wide initiatives were not associated with adolescent sexual behaviors (including sexual initiation, frequency of sexual activity, condom or contraceptive use, and pregnancy or birth outcomes). The minimal impacts may be due to their extremely challenging goal of attempting to affect community-wide outcomes. Further, among programs that showed some effects on outcomes, these effects disappeared after the program ended. However, in absence of experimental design, no concrete conclusions can be made about these types of programs.

Nurse Home Visit Programs

Some nurse home visitation programs have found a significant reduction in subsequent pregnancies to poor unmarried women (Olds et al., 1999). Nurse Home Visitation Programs enlist trained nurses to visit expectant mothers in their homes both before their baby is born and after birth in order to provide information and support that would promote better maternal and child outcomes. In two areas assessed, Elmira, New York and Memphis, Tennessee, low-income unmarried mothers who received nurse home visits had fewer repeat pregnancies than mothers who did not receive home visits (Olds et al., 1999). One welfare program, the Teenage Welfare Demonstration Program, also includes a Nurse Home Visit component and is associated with reducing subsequent fertility among teens in a quasi-experimental design (Murray in Blank & Haskins, 2001).

Summary: Societal / Policy

Programs to encourage healthy adolescent reproductive behaviors exist in many forms and have varying degrees of success. Several programs show encouraging results, but more rigorous experimental studies are needed to clearly identify promising strategies. These studies suggest that interventions that focus on early childhood literacy, youth development, community volunteering, and nurse home visiting may complement more traditional sexuality education programs.

Intensive early childhood programs represent an exciting possibility for promoting long-term healthy behaviors. Youth who received interventions from infancy through elementary school have shown a greater likelihood of delaying childbirth in their teenage years.

Adolescents involved in community volunteer service learning programs that include volunteering and classroom activities exhibit a lower likelihood of engaging in sexual activity

and becoming pregnant. However, vocational education programs have shown minimal impacts on reproductive health outcomes.

Adolescent programs that combine a focus on youth development with sexuality education provide a promising approach for delaying sexual initiation and reducing pregnancy and childbearing among female adolescents. However, current programs are intensive and long-term and have positive impacts among females only.

Some sexuality and HIV education programs were associated with delaying first sexual intercourse, reducing the frequency of sex and increasing contraceptive use. The most successful programs shared important characteristics, such as a clear focus, accurate information, practical skills development, and a time-intensive commitment. Only one abstinence-only program has been experimentally evaluated and it showed no impact on reducing sexual activity among teenagers; however, stronger evaluations are forthcoming. In addition, some clinic-based programs, which included one-on-one counseling, showed positive impacts on reproductive health outcomes.

School-based health centers, condom availability programs, and community-wide initiatives have not been experimentally evaluated and no concrete conclusions can be made from any of these studies.

With few exceptions, welfare demonstration programs aimed specifically at teenage mothers have shown minimal effects on subsequent fertility behavior. Some intensive nurse home visiting program for expectant mothers are associated with reductions in subsequent fertility among teenage mothers.

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Summary Table: Review of the Research Literature and Implications for Targeted Activities to Improve Adolescent Reproductive Health

AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Initiation of Sexual Intercourse	- A program that included voluntary community service, preparation time, and time for reflection after service through activities such as group discussions, papers, or journaling had a positive impact (Reach for Health).	- Only 1 abstinence-only education program has been experimentally evaluated (Postponing Sexual Involvement/ENABL) and showed no impact on sexual activity. Few strong experimental evaluations of abstinence-only programs have been conducted. Future evaluations will assess the effectiveness of these programs. - Only 1 experimental study has examined the impact of programs to increase parent-child communication about abstinence, sexuality, or HIV. This program showed no impact on the initiation of sexual intercourse (Facts and Feelings).	- 8 sexuality education programs measured sexual initiation as an outcome. Of these, 1 showed positive impacts for boys (Draw the Line/Respect the Line), 1 showed positive impacts for girls (Postponing Sexual Involvement, Human Sexuality, and Health Screening), 5 showed no impact (McMaster Teen Program; Project SNAPP; Safer Choices; Teen Talk; and Blake et al., 2000 in Michigan), and 1 showed negative impacts for 9th and 10th graders (Healthy for Life Project). - Of the 5 HIV/AIDS education programs that measured sexual initiation as an outcome in experimental evaluations, 2 showed positive impacts (Becoming a Responsible Teen and Be Proud! Be Responsible! A Sexual Abstinence Curriculum). Three programs showed no impacts (Be Proud, Be Responsible; Be Proud! Be Responsible! A Safer Sex Curriculum; and YAPP).	- Reduce other risky behaviors such as substance abuse and delinquency - Focus on developing abstinence values among teens and encourage them to sign virginity pledges - Work with adolescents to change their perception that most peers are sexually active and that sexual experience elicits respect from peers - Improve educational performance - Encourage teens to form high educational aspirations - Promote participation in sports (effective for girls only) - Place importance on religious and moral beliefs - Promote church attendance/religiosity/religious activities - Having an older sibling who is sexually experienced is a risk factor for early sexual initiation. - Promote stability in parents' marital status - Strengthen parent-child emotional bonds and relationships - Encourage parents to talk with their teens about sex and contraception; in particular, communicate disapproval of these behaviors - Advocate strong parental monitoring

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
				- Focus on ways to reduce "intergenerational transmission" of teenage sexual behaviors - Improve family economic standing and parent education - Live in a community with higher socioeconomic status and lower crime levels. - Encourage teens to form friendships with peers who favor delayed sexual initiation and with same-age peers (as opposed to older teens), or change peer group values. - Reduce the occurrence of non-voluntary sexual experiences - Delay teen involvement in romantic relationships - Of sexuality and HIV education programs, Kirby's review (2001) of primarily experimental studies concludes that 10 components are needed to improve outcomes: *1) Aim to reduce behaviors leading to pregnancy or STIs. 2) Adapt theory-based approaches shown to be effective for other health outcomes to reproductive outcomes.* *3) Consistently emphasize abstinence and contraception.* *4) Provide basic factual information about the risks of sex, as well as methods of disease and pregnancy protection.* *5) Incorporate activities that teach teens to deal with social pressures about sexual behaviors.* *6) Help teens develop communication, negotiation, and refusal skills.* *7) Use participant involvement methods so information is more personalized to teens.* *8) Gear training to the specific teen population being served.*

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				9) Allow enough time for teens to absorb message *10) Provide strong training to committed teachers or peer leaders.* *(Kirby, 2001, p.6).* - Sexuality or HIV education programs that did not include the 10 components listed in "what works," including programs that were primarily didactic and that did not include teen involvement were not associated with delayed sexual initiation. - Programs short in duration appear to have no association with outcomes, suggesting longer durations are more desirable.

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Frequency of Sexual Activity		- Only 1 abstinence-only education program has been experimentally evaluated (Postponing Sexual Involvement/ENABL) and it showed no impact on the frequency of sexual activity. Few strong evaluations of abstinence-only programs have been conducted. Future evaluations will assess the effectiveness of these programs. - All 3 clinic-based programs that examined frequency of sexual activity as an outcome found either no impacts (ASSESS; Danielson et al. 1990 in Portland, OR and Vancouver, WA) or negative impacts (DeLameter et al. 2000 in Milwaukee, WI). - 2 sexuality education programs measured frequency of sexual activity as an outcome (Project SNAPP and Safer Choices). Neither program showed an impact on the outcome.	- 5 HIV/AIDS education programs measured frequency of sexual activity as an outcome. 2 showed positive impacts among at least some populations (Becoming a Responsible Teen; and Be Proud, Be Responsible); 2 had no impact (Be Proud! Be Responsible! A Sexual Abstinence Curriculum and YAPP); and 1 had some positive impacts that varied by length of follow-up (Be Proud! Be Responsible! A Safer Sex Curriculum). - One program that combines youth development and sexuality education and had a positive impact on the frequency of sexual activity (Washington State, 1 out of 3 sites had a positive impact).	- Focus on delaying age of sexual debut - Promote participation in sports (effective for girls only in non-experimental research) - Having an older sibling who is a teen parent is a risk factor. - Implement AIDS education (effective for non-blacks, but not for blacks) - Strengthen mother-child relationships and combine with mom's disapproval of sex (for sample of low SES blacks) - Promote high parent education levels - Sexuality education and HIV education programs that include 10 components were associated with more positive outcomes (Kirby, 2001) (see above). - Sexuality or HIV education programs that did not include the 10 components listed in "what works," including programs that were primarily didactic and that did not include teen involvement were not associated with a reduced frequency of sexual activity. - Programs short in duration appear to have no association with outcomes.

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Number of Sexual Partners		- Only 1 abstinence-only education programs has been experimentally evaluated (Postponing Sexual Involvement/ENABL) and it showed no impact on the number of sexual partners. Few strong evaluations of abstinence-only programs have been conducted. Future evaluations will assess the effectiveness of these programs. - The two clinic-based programs that examined number of sexual partners showed either no impacts (ASSESS) or a negative impact (DeLameter et al. 2000 in Milwaukee, WI). - Out of the 2 sexuality education programs that experimentally measured the number of sexual partners as an outcome, neither had an impact (Project SNAPP and Safer Choices).	- Of the 4 HIV/AIDS experimental education programs that measured the number of sexual partners as an outcome, 1 showed positive impacts (Be Proud, Be Responsible). The other 3 programs had no impact (Becoming a Responsible Teen; YAPP; and Gilmore et al. 1997 in Seattle, WA)	- Focus on delaying age of sexual debut - Reduce other risky behaviors such as substance abuse and delinquency - Promote participation in sports (effective for girls only) - Convey to parents the importance of talking to teens about HIV and expressing disapproval of teen sexual activity - Advocate strong parental monitoring - Reduce the occurrence of non-voluntary sexual experiences - Encourage teens to form friendships with peers who are not sexually experienced - Sexuality education and HIV education programs that include 10 components were associated with more positive outcomes (Kirby, 2001) (see above) - Sexuality or HIV education programs that did not include the 10 components listed in "what works," including programs that were primarily didactic and that did not include teen involvement were not associated with fewer sexual partners. - Programs short in duration appear to have no association with outcomes, suggesting longer durations are more desirable.

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Use of Condoms for STI and/or Pregnancy Prevention		- Only 1 abstinence-only education program has been evaluated (Postponing Sexual Involvement/ENABL) and showed no impact on condom use. Few strong evaluations of abstinence-only programs have been conducted. Future evaluations will assess the effectiveness of these programs.	- 3 sexuality education programs focused on condom use as an outcome. One program had a positive impact (Safer Choices) and 2 programs showed no impacts (Healthy for Life Project and Project SNAPP). - 7 HIV/AIDS education programs measured condom use as an outcome. 3 programs had a positive impact (Becoming a Responsible Teen; Be Proud, Be Responsible; and Be Proud! Be Responsible! A Safer Sex Curriculum); 3 had no impact (YAPP; Gilmore et al. 1997 in Seattle; and Slonim-Nevo et al. 1996 in St. Louis); and 1 had some positive impacts that varied by length of follow-up (Be Proud! Be Responsible! A Sexual Abstinence Curriculum). - Clinic-based programs that include counseling and instruction from a medical provider, give a clear message about sexual activity and contraceptive use, and include 1-on-1 counseling may have had mixed impacts on condom use. 2 such programs showed positive impacts (DeLameter et al. 2000 in Milwaukee, WI; Orr et al. 1996 in Indianapolis, IN), and 1 had mixed impacts depending on length of follow-up (ASSESS).	- Reduce other risky behaviors such as substance abuse and delinquency - Convey to parents the importance of talking to teens about HIV and condom use and of expressing disapproval for teen sexual activity - Advocate strong parental monitoring - Promote high parent education levels - Work to change adolescents' perception that peers do not like or use condoms - Talk with partner about sexual risks (findings based on non-representative sample – blacks & Hispanics in AL, NY and Puerto Rico) - Sexuality education and HIV education programs that include 10 components were associated with more positive outcomes (Kirby, 2001) (see above) - Sexuality or HIV education programs that did not include the 10 components listed in "what works," including programs that were primarily didactic and that did not include teen involvement were not associated with increased condom use. - Programs short in duration appear to have no association with outcomes, suggesting longer durations are more desirable.

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Use of Contraception		- Only 1 abstinence-only education program has been evaluated (Postponing Sexual Involvement/ENABL) and showed no impact on contraceptive use. Few strong evaluations of abstinence-only programs have been conducted. Future evaluations will assess the effectiveness of these programs.	- 5 sexuality education programs measured contraceptive use as an outcome in experimental studies. Of these, 1 showed a positive impact (Safer Choices), 1 had positive impacts for boys only (Teen Talk), 1 had a positive impact for girls only (Postponing Sexual Involvement, Human Sexuality, and Health Screening), and 2 showed no impacts (McMaster Teen Program and Project SNAPP). - Intensive long-term youth development programs that combine youth development and sexuality education (CAS-Carrera had a significant impact for females but not males and Washington State for contraceptive use at most recent sex at 1 of 3 sites and for always use contraceptives at 2 of 3 sites). - 2 clinic-based programs aimed to improve contraceptive use. 1 program had a positive impact (Danielson et al. 1990 in Portland, OR and Vancouver, WA), while the other had no impact (Herceg-Baron et al. 1986 in Philadelphia).	- Reduce other risky behaviors such as substance abuse and delinquency - Implement contraceptive education in schools - Promote participation in sports (effective for girls only) - Provide supports for maintaining intact families - Strengthen parent-child relationships - Promote high parent education levels - Encourage teens to date partners close to their own age, rather than older partners - Reduce the occurrence of non-voluntary sexual experiences - Sexuality education and HIV education programs that include 10 components were associated with more positive outcomes (Kirby, 2001) (See above) - Programs short in duration appear to have no association with outcomes, suggesting longer durations are more desirable. - Attending schools with school-based or school-linked health clinics that provide contraceptives, focus intensely on contraception, and give a clear message about abstinence and oral contraceptives were associated with increased contraceptive use.

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Pregnancies and Births	- Programs that include voluntary community service, preparation time, and time for reflection after service through activities such as group discussions, papers, or journaling. (Teen Outreach Program) - Early childhood programs that include strong preschool child care for low-income families reduce the likelihood of pregnancies and births during the teen years (Abecedarian) and out of wedlock births by age 27 (High/Scope Perry Pre-School). - Nurse home visiting programs, in which trained nurses visit expectant teen mothers before and after the baby is born and help promote maternal and child outcomes reduce subsequent pregnancies. (Olds)	- Welfare demonstration programs have shown minimal impacts on subsequent fertility (New Chance, TPD) - Neither of the 2 sexuality education programs that focused on pregnancy/births had an impact (McMaster Teen Program and Project SNAPP) - The only clinic-based program to measure pregnancy outcomes showed no impact (Herceg-Baron et al. 1986 in Philadelphia).	- One short-term youth development program (Quantum Opportunities) showed no impact on birth rates, except in the Philadelphia site. - Of the 4 vocational education programs that measured pregnancies and births as an outcome, only one showed a positive impact (Conservation and Youth Service Corps). This positive impact was observed for black women only; there was no impact on non-Hispanic white or Hispanic women. The other 3 programs vocational education programs had no impact (Job Corps; JOBSTART; STEP) - One intensive long-term program that combines youth development and sexuality education (CAS-Carrera for females but not males)	- Focus on delaying age of sexual debut - Reduce other risky behaviors such as substance abuse and delinquency - Improve educational performance - Discourage dropping out of school - Encourage teens to form high educational aspirations and to develop friendships with peers who have also high educational aspirations - Promote participation in sports (effective for girls only) - Promote church attendance/ religiosity/ religious activity - Having an older sibling who is a teen parent is a risk factor - Encourage parent-child communication about pregnancy - Strengthen parent-child emotional bonds and relationships - Emphasize importance of shared activities between parents and children - Improve family socioeconomic standing - Provide supports to maintain intact families - Convey to parents the importance of having high college expectations for their adolescents (effective for boys) - Focus on ways to reduce "intergenerational transmission" of teenage sexual behaviors - Encourage teens to date partners close to their own age, rather than older partners - Reduce the occurrence of non-voluntary sexual experiences - Attend school with higher socioeconomic status and lower crime

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AREAS FOR TARGETED INTERVENTION ACTIVITIES	WHAT WORKS	WHAT DOESN'T WORK	MIXED REVIEWS	"BEST BETS"
Contracting STD	- Very few intervention programs have measured STD outcomes. However, programs that are associated with delayed sexual initiation, reduced frequency of sexual intercourse, fewer sexual partners, and increased condom use will also affect STD outcomes (see other parts of this table). - The ASSESS clinic-based program measured STD outcomes and found a positive impact.	- Only 1 sexuality education program has targeted STD outcomes and it did not have any impact (Project SNAPP).		- Focus on delaying age of sexual debut - Reduce other risky behaviors such as substance abuse and delinquency - Emphasize to teens the risks of having multiple partners - Encourage teens to date partners close to their own age, rather than older partners - Make contraceptives accessible and easy to use (beneficial for males) - Teach males that they are as responsible for contraception as their female partners

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